

NEW Z E A L A N D ' S C O A S T A L T R A D E.

V O L U M E T W O.

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F O R E W A R D .

This thesis is compiled in two separate volumes.
Volume 1 consists of an assemblage of maps, graphs and flowcharts which are numbered serially so that they can be referred to readily in the text.

Volume II consists of a descriptive statement designed to accompany and explain the maps, graphs, flowcharts and photographs.

Most of the information assembled in the field study is recorded in the diagrams in Volume 1. These have been draughted by the writer and reproduced by a sun printing process.

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M.V. Holmwood, at Raglan, loading deck cargo for South Island ports.

I N T R O D U C T I O N .

"Coastal shipping has reached the stage where it is driving itself out of business and where air transport is taking over its functions. It is about the most inefficient in the world." ¹

It is to examine, from the geographer's point of view, the validity of such statements that this thesis is being written. The examination will be introduced by a brief description of the factors leading up to the present system of coastal shipping. The various facilities available for coastal trade will then be discussed. The bulk of the thesis will comprise a study of the movement of cargoes on the New Zealand coast. Recent or projected developments in coastal shipping will be examined with reference to competition with other forms of transport.

A further important aim is to show throughout the thesis how coastal trade contributes to the geographical character of New Zealand, and to the distinctiveness of areas within the country.

Apart from a few books written by historians, the only previous studies related to coastal trade are unpublished geographical theses.²

¹ T.P. Shand (Postmaster-General and Minister in charge of Civil Aviation): Reported in the Otago Daily Times, 9.5.57.

² Ruth Allen: The History of the Port of Nelson, Well., 1954.

C.E. Hassall: A Short History of the Port of Timaru, 1852 - 1955, Timaru, 1951.³

A.H. McLintock: The Port of Otago, Dunedin, 1951.

Most of the latter are comparative studies of certain ports, and include a discussion of their trade.³ One gives a very complete picture of South Island ports, but the topic is treated from the point of view of urban geography rather than transport geography.⁴ It's author does, however, include a chapter on port hinterlands which lie outside the scope of this thesis. North Island hinterlands have been the subject of another work.⁵ Coastal trade in one part of the country has been studied, but again historical development has been the chief interest of the author.⁶ The thesis to be presented here is thus the first attempt to present a geographical picture of coastal trade on a national basis.

The field work, carried out during the years 1957 and 1958 has necessitated a great deal of travelling and correspondence. Nearly all ports between Stewart Island and Auckland have been visited by the writer, the only ones omitted being a few minor landing stages. Naturally not all the information required could be obtained on these tours, so that later correspondence was entered into with thirty port authorities.

³ V.M. Barnes: The Port of Lyttelton: Unpublished University of New Zealand Thesis, 1954.

A.E. Tarrant: The Ports of Bluff and Otago: Unpublished University of New Zealand Thesis, 1952.

R.H. Wheeler: The Port of Timaru: Unpublished University of New Zealand Thesis, 1948.

R.A. Wright: Tauranga and Whakatane: Unpublished University of New Zealand Thesis, 1952.

⁴ A.G. Ward: The Seaports of the South Island: Unpublished University of New Zealand Thesis, 1954.

⁵ L.M. Gracey: Export Hinterlands of the Ports of the North Island: Unpublished University of New Zealand Thesis, 1951.

⁶ M.O. Nicholas: The Significance of Coastal Shipping in the Economic Development of Northern New Zealand: Unpublished University of New Zealand Thesis, 1957.

The head offices of most coastal shipping companies are situated in Auckland, Wellington or Christchurch. These were also visited, and in most cases confidential records were made available to the writer. Further information was received by letter from twenty-three shipping companies.

At the outset of the field work it was hoped that information showing the quantities of cargo shipped between one port and another would be readily available. This was not found to be the case. Very few port authorities abstract statistics other than the total tonnage of cargo entering and leaving the port. The shipping companies are similarly interested only in the quantity of cargo loaded and discharged at each port by their vessels. The chart showing frequency of shipping services and many of the flowcharts could thus be completed only after reference to many thousands of ships' manifests which are filed at the offices of shipping companies and harbour boards. In constructing the flowcharts for individual commodities much help was gained from the manufacturers and distributors of the particular products.

The year 1956 has been chosen as the specimen year for two reasons: Firstly, it was the most recent year for which a complete set of figures were available on certain topics, and secondly, it was a year uncomplicated by strikes, import restrictions or any other unusual events on the waterfront.

A great deal of time has been spent in visits to the head offices of the Department of Statistics, the Marine Department, the Waterfront Industry Commission, the New Zealand Shipowners' Federation, the Wheat Research Committee, and various offices of the Customs Department. On all these visits the writer was given much valuable advice and information.

Facts were also supplied by many individuals with a knowledge of various aspects of coastal trade. They are too numerous to mention here by name, but their assistance is gratefully acknowledged along with that given by the officers of the many organizations referred to previously.

Most of the data collected has been represented in diagram form so that the pattern of coastal trade may be readily appreciated by the reader. It has proved to be a satisfactory way of correlating figures derived in most cases from a variety of sources. At the same time it protects the interests of private companies to whom much of the information is confidential. The diagrams have been assembled in one volume so that they may be easily referred to as the text is read. They have been reproduced at the same scale as the original drawings, partly to save expense and partly to retain the legibility of some of the finer detail.

The problems to be investigated are thus three in number: Is coastal trade as efficient as it might be? Is it on the decline and doomed to extinction? How far does it contribute towards the distinctiveness of areas within New Zealand? It is realised that many facts which might go far to answer these questions will not be

presented in this thesis. Some could not be made available to the writer, but many more lie outside the geographer's field of study.

CHAPTER I.

DEVELOPMENT OF COASTAL TRADE.

The present state of New Zealand's coastal trade can be understood more clearly in the light of its historical development. This development has been a gradual process, but it can nevertheless be divided into a few periods for the purposes of study. From 1840 to 1860 the trade was chiefly within the provinces and was carried on by small sailing vessels. The advent of the steamer ushered in a period of development from 1860 to 1900. During this period many shipping companies were formed and inter-island trade became well established. Coastal trade from 1900 to 1928 was characterised by the further development of inter-island services. Cargo tonnages increased, but this was followed by a period of decline during which larger vessels were introduced, while services became less frequent. The post-war years have seen few changes in the patterns of coastal trade. Although there has been a trend towards smaller vessels and modern methods of cargo handling, there has been almost no increase in the volume of cargo shipped coastwise.

Ever since the first European settlement of New Zealand there has been some form of coastal trade. As early as the 1840's, cutters, schooners, ketches and even Maori canoes were used for trade in the Hauraki Gulf. In 1849 there were no roads either north or south from Dunedin, but cutters and schooners were carrying on a coastal trade from Otago Harbour to Oamaru, Moeraki, Waikouaiti, Taieri and the Clutha districts. Vessels also traded from Wellington to Auckland and Dunedin, and later to Canterbury ports.

The introduction of the steamer to New Zealand in 1859 brought new life to coastal trade. By 1868 there were thirty-six well established ports in the North Island and twenty-three in the South Island, and throughout the 1870's, coastal trade developed rapidly.¹ Regular steamer services began to operate to ports in all parts of the country, and a passenger service between Auckland and Dunedin was inaugurated in 1877 (Figs.1 and 2). Many shipping companies, including the well-known Union Steam Ship Company, were formed, but not all met with success. Trade between the North Island and the South Island was given impetus by the early discovery of gold in Otago, and by the agricultural development of Canterbury. Wool, grain, flour, hides and tallow were shipped to the North Island, while cargoes transhipped from the North Island to the South included thousands of coils of wire and bundles of standards. During this period the coastal fleet was also employed in the transportation of building materials for the railways. On the other hand, when the railway line between Christchurch and Dunedin was completed in 1878, it took over the functions of the coastal fleet in carrying freight between east coast South Island ports.

This was also the era of the shallow draught scow. This type of vessel was designed to enter the shallow river ports and bays of North Auckland, but it was used throughout the country and is still occasionally to be seen on the coast today. One of its chief uses was in the

¹ Sir George Bowen, Governor of New Zealand: New Zealand Gazette No.66, Wellington, November 1868.

timber trade of the Auckland province where Kauri logs had to be shipped from remote mills to the port of Auckland.

The closing years of the nineteenth century saw few changes in the general pattern of coastal trade. In spite of the development of roads and railways, coastal trade within each province was still considerable. Between the Bay of Plenty and Wellington, one shipping company served no less than seventy-five coastal landings, and shipping was the only means by which the settlers could get their supplies and distribute their products. Nearly all the coal and timber requirements of the South Island east coast were shipped from Westland.

The period between 1900 and 1928 was one of great coastal activity. Although some ports fell into disuse, those which remained received more coastal shipping than they do today (Figs. 1 and 2). The North Island, entering an era of development, imported much primary produce from the South Island, while the Westland coal trade reached its zenith in 1910 (Figs. 7 and 8). Between the east coast of the South Island and the west coast of the North Island two shipping companies began the services which still continue to operate. But while inter-island shipping increased, many local services declined. Competitive railway rates between east coast ports of the South Island had put an end to coastal trade between east coast ports of the ~~South Island~~. The coastal trade of Auckland Province was also greatly reduced. Not only had the timber trade declined, but roads and railways were being developed. In 1925 Whangarei was linked by rail with Auckland, and in 1927 the Auckland to Tauranga line was completed.

Coastal trade between ports of the North Island west coast practically ceased when the railway finally linked Auckland and Wellington in 1908.

From 1928 the total volume of coastal trade declined rapidly (Figs. 13 and 14). This was due largely to the opening of the Otira Tunnel through the Southern Alps between Westland and Canterbury. This enabled coal and timber, which had formed the bulk of the South Island coastal trade, to be railed direct to South Island destinations. Coastal trade between South Island ports virtually ceased, while that between North Island ports was greatly diminished by improved roading. The inter-island trade was then maintained by a small number of larger steamers (Fig. 14). With the Depression years, even inter-island trade declined, reaching a minimum in 1933.

Since the Second World War, the volume of coastal trade has been fairly constant. Many small, modern vessels have been bought by ship-owners in an effort to ensure the prompt delivery of goods. In spite of the country's larger population, however, coastal trade has not reached its 1928 level (Fig. 13). Air, road and rail transport are now taking many cargoes once carried by sea, and many criticisms have been levelled at the efficiency of coastal shipping. It was these criticisms that prompted this study of New Zealand's coastal trade.

CHAPTER II.

While an efficient fleet of vessels is vital in maintaining coastal trade, these would be rendered useless without suitably placed, well equipped ports, and an effective waterfront labour force.

These three main elements of coastal shipping in New Zealand will now be examined from the point of view of their structure and problems, their areal differentiation, and their efficiency. This examination will lead to some general conclusions regarding the nature of New Zealand's coastal services and to an idea of where, if at all, these facilities need to be improved.

PART A: PORTS.Types:

While the ports of New Zealand contribute greatly to the geographical character of the country, it is also true that the nature of the ports themselves is largely determined by the configuration of the coastline. In fact, many of the problems facing the coastal trade today, are the result of natural features, rather than economic conditions. The following table shows the way in which physical features have influenced the siting of our ports:

TYPES OF PORTS SERVING COASTAL TRADE.

NORTH ISLAND RIVERS	INLETS	BREAKWATERS	OPEN BAYS	
Awanui	Houhora	Napier	Kawau	
Whangarei	Manganui	New Plymouth	Colville	
Whakatane	Whangaroa		Coromandel	
Opotiki	Bay of Islands		Whangaparaoa	
Gisborne	(Opua, Russell, Kerikeri)		Thames	
Patea			Hicks Bay	
Wanganui	Whangarei		Tokomaru Bay	
	Portland		Tolaga Bay	
	Auckland			
	Onehunga			
	Raglan			
	Whitianga			
	Tauranga			
	Mt. Maunganui			
	Kutarere			
	Wellington			
SOUTH ISLAND	Motueka	Nelson	Timaru	Collingwood
	Mapua .	Havelock	Oamaru	Waitapu
	Wairau	Tory Channel		Tarakohe
	Westport	Picton		Riwaka
	Greymouth	Lyttelton		French Pass
	Kaiapoi	Dunedin		Jacksons Bay
		Bluff		
		Oban		



Port of Napier



Port Taranaki, New Plymouth.



At Nelson the Boulder Bank provides a natural breakwater.



Port of Oamaru.

Only four New Zealand ports have to rely on extensive artificial breakwaters, but even these obtain some shelter from coastal promontories. They are not entirely free from problems arising from their location. As breakwaters can only be built in relatively shallow water, these ports require almost constant dredging. Furthermore, at Timaru in particular, marine drifts of sand and shingle from the south have necessitated expensive additions to the breakwater systems.

In general, New Zealand rivers are not suitable for navigation but in a few cases they furnish safe anchorages on otherwise inhospitable coasts and permit the handling of cargoes very close to the areas of supply and demand. Although most of the ports are situated a short distance within the mouths of the rivers, the port of Wairau is twelve miles inland. The port at Wanganui, four miles from the mouth of the river, has recently fallen into disuse and has been replaced by Castlecliff at the river mouth.

There are, however, several problems associated with river ports. Nearly all New Zealand rivers have sand or shingle bars situated at their mouths, and these prevent the maintenance of a cheap and regular coastal service. Vessels are frequently delayed for short, but nevertheless expensive, periods awaiting the tides. More serious delays occur during and immediately following periods of rough weather, when the building up off-shore bars can prevent shipping movements for days at a time. In this respect Patea, Wanganui, Westport and Greymouth are the most affected because of their westerly aspect, but occasional delays also occur at Whakatane, Opotiki and Wairau.



N.S. Seaward Photo.

Coastal vessel at Whakatane.



White's Aviation Photo.

Opatiki, showing river port.



N.S. Seaward Photo.

Gisborne, with river port in right foreground.



Coastal vessels berthed at Gisborne.



Coastal vessel berthed at Wanganui.



Wairoa River.

Both these ports have now fallen into disuse.



Waitapu



Motueka



Riwaka

All these Nelson river ports are tidal.

No delays have occurred at Kaiapoi since the port was reopened in November, 1958, but the vessels using this port draw less than seven feet and can negotiate the bar even at low water.

The irregular flow in some rivers also hampers coastal trade. A low flow in the river at Greymouth causes shoaling on the bar, whereas floods can cause silting at the wharves. The only river port which can be negotiated by coastal vessels at any time, is Gisborne, and this is made possible only by constant dredging.

Naturally, the size of vessels working river ports is limited, and at only a few do they exceed 200 tons. Vessels drawing more than nine feet are excluded from most ports and the width of the waterway available imposes a limitation on the length of vessels; for example, at Westport vessels of seventeen feet draught can work the port only if they are less than 350 feet in length.

Inlets are usually most suitable as port sites and New Zealand is fortunate in having some of the finest in the world. At present, twenty-three ports are sited on these inlets and only a few have serious problems arising from their location. Silting is the most general problem, and regular dredging is necessary at Whangarei, Nelson, Lyttelton and Dunedin. In Otago Harbour, a channel of seventeen miles has to be maintained, while a distance of two miles is dredged at Lyttelton. Since the destruction of the local forests, silting has occurred at Whangaroa and at Havelock. As a result, the upper harbour at Whangaroa has now become innavigable, and five miles of winding road from Kaeo to the lower harbour now have to be negotiated by vehicles serving the port.



V.C. Browne Photo.

Port of Auckland.

1930's 1940's ?



White's Aviation Photo.

Tauranga Harbour.

At Havelock only vessels of forty tons can enter and coastal trade has dwindled almost to nothing.

Only Onehunga, Kutarere and Dunedin have sand bars at the mouths of their harbours. At the first two mentioned vessels are occasionally delayed, but at Dunedin the problem has been overcome by the construction of a mole which funnels the ebb tide so that it scours a permanent channel.

Some minor New Zealand ports consist of nothing more than an unprotected bayhead jetty. While there is usually a good depth of water, coastal vessels are sometimes delayed because of rough weather. Particularly affected in this way are Hicks Bay, Tolaga Bay and Tokomaru Bay, where fresh winds with an easterly component sometimes necessitate the diversion of vessels to other ports.

Although situated in an open bay, the port of Thames has some of the characteristics of a river port. It lies just beyond the estuary of the Thames River and is therefore subject to silting which restricts the size of vessels to less than sixty tons. Even these small ships are forced to wait for high tides.

Port Administration:

There is a surprising variation in the way in which port activities are administered. Many small ports are administered by local Borough or County Councils. Westport is controlled by the Marine Department, and Picton by the Railways Department. The larger ports, however, are administered by Harbour Boards, with locally elected members. There are now twenty-four of these Boards in New Zealand.



Present coastal berth at Bluff. M.V. Karu.



Wharf at Oban, Stewart Island.

Through the Harbours Act the Government exercises a certain degree of overriding control. For instance, some harbour works can only be undertaken with the consent of the Minister of Marine. Nevertheless the Boards receive no financial assistance from the Government.

There is further diversity in the methods by which the Boards carry out their functions. At some ports, generally known as the "Railway Ports", the Board provides the wharves and necessary equipment and has an arrangement whereby the Railways Department acts as wharfinger and handles all cargo entering or leaving the port. All cargo is carried between the wharves and the sorting sheds in railway waggons. Ports at which this system operates are New Plymouth, Lyttelton, Timaru, Oamaru and Bluff.

At Dunedin, the Otago Harbour Board provides wharves, equipment and sheds, and contracts with a stevedoring firm to handle cargo to and from the ship's side.

The Auckland Harbour Board provides wharves, sheds and equipment for handling cargo. The shipping companies or stevedoring firms receive from and deliver cargo to the consignor and consignee, as the case may be.

Wellington, Napier and Nelson are "Wharfinger Boards". This indicates that, as well as providing all the facilities, they receive and deliver all cargo from the ship's side.

Berthage Space:

To maintain a regular coastal shipping service, adequate berthage space must be available at all ports. Research for this thesis has shown that the berths for coastal vessels at all New Zealand ports are generally adequate. In fact, only at Tauranga, New Plymouth and Bluff



Hicks Bay



Tokomāru Bay



Tolaga Bay

This concrete jetty, built in 1924, is half a mile long.

are coastal vessels occasionally delayed because of port congestion, and at these three ports reconstruction works will shortly remove this problem. At most purely coastal ports there are only one or two berths, but Greymouth with six, Gisborne with four, and Wanganui with three, are exceptions.

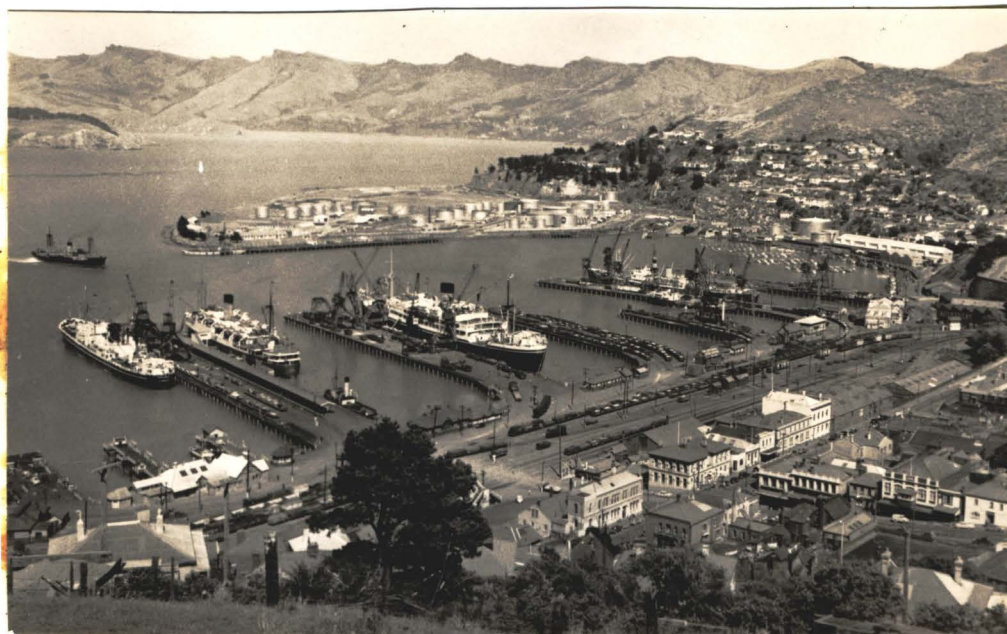
The possibility of areal differentiation between coastal and overseas berths within the ports was considered. It was found, however, that at all ports coastal vessels may at times berth at wharves generally used by overseas vessels. There is no strict division between coastal and overseas port facilities. It should nevertheless be noted that at Auckland, Wellington, Lyttelton, Dunedin and Bluff there are areas which are reserved exclusively for coastal vessels.

Cargo Handling Facilities:

While the cargo handling facilities at nearly all ports are considered adequate by the administrative bodies, there is no doubt that improved facilities would result in a quicker and probably cheaper coastal shipping service. All coastal vessels are equipped with gear for loading and discharging their cargo, but the work can be done rather more quickly by cranes operating from the wharf. The only ports operating such cranes are Auckland, New Plymouth, Westport, Greymouth, Lyttelton and Dunedin, and even at these ports most coastal vessels use their own gear. The only other equipment used in addition to coastal ships' gear is the pipelines installed at some ports to unload bulk motor spirit and bulk cement.



National Publicity Studios Photo.
Port of Wellington, showing wharf sheds and roadways.



Goodall Photo.
Coastal Vessel entering Port of Lyttelton.
This port is operated with railway transport and the
sheds are at Christchurch.

To give some idea of the cargo handling facilities available at the major ports, at Auckland there are sixtyseven cranes of various types, fiftythree tractors, 247 trailers and thirtyfive fork hoists. By comparison, Wellington facilities include eightytwo cranes, fortytwo tractors, 470 trailers and five forklift trucks. At Lyttelton there are twentyeight cranes and at Dunedin there are ten.

If freight is to be sorted and despatched quickly there must be adequate shed space adjacent to the wharves, for congestion in sheds could lead to the cessation of discharging operations and delays to shipping. Storage charges are therefore kept relatively high in order to encourage consignees to uplift their goods promptly.

At Lyttelton and Timaru lack of shed space has now become a problem. In fact, at Lyttelton there are no transit sheds. Goods are railed to the Christchurch railway station before being sorted and dispatched to the consignee. Delays due to congestion, particularly just after the weekend, have led to the recent reopening of the port at Kaiapoi. However, it is hoped that the situation will be improved by the projected road tunnel between Christchurch and Lyttelton, together with roadways on to the wharves.

Only seven New Zealand ports are served entirely by railways, nine have both rail and road communication on to the wharves, and the remainder are road ports. There is no doubt that rail transport is a distinct advantage in the handling of some cargoes. The coal trade from Westport and Greymouth, for instance, is dependent on rail transport.

The handling of general cargo by a railway system tends, however, to be slower and more expensive than handling by road transport. There are many cases where goods must be double handled from road vehicles to railway trucks before being loaded into the ship. It is of interest to note that the port of New Plymouth has recently been the scene of successful experiments in the simultaneous operation of road and rail transport. Other railway ports are taking steps to introduce road transport onto the wharves, but the conversion at ports such as Oamaru will be very expensive and difficult.

Many ports offer other facilities to coastal vessels in the form of fuel, water, lighting and telephone, but as these are easily installed and apparently adequate for the trade, they require no further mention.

PART B: SHIPPING:

Administration:

The administration of coastal shipping in New Zealand is characterised by a very large number of private companies each owning a small number of vessels (Figs. 17 to 28). There are twentyseven shipping companies concerned with the coastal trade, including two companies whose shareholders are also producers of the cargo carried. In addition, four manufacturing companies own and operate their own coastal vessels. Two are cement manufacturers, one is an oil company, and the other is a distributor of building materials. The passenger and cargo ferry between Bluff and Stewart Island is the only coastal service operated by the Government.

These companies own and charter ships engaged in the trade and carry out various operations connected with the cargo carried in their ships. Operations differ according to the functions performed by the Harbour Boards, but at all ports the shipping companies are responsible for the delivery of cargo by land transport to the ships, and the employment of labour on the ships for cargo working-operations.

The principal companies concerned with coastal shipping achieve some unity through membership to The New Zealand Shipowners' Federation. In general, the Federation's functions are to promote the interests of its members and to present a co-ordinated view point for the industry.

The coastal fleet operates under the strict control of the Marine Department administering the Shipping and Seamen Act of 1952, which covers nearly every activity in which ships and seamen are involved. The Department also provides and operates navigational aids around the coast and publishes navigational information in the New Zealand Nautical Almanac and Tide Tables and Port Information.

The Coastal Fleet:

In 1956 there were 131 ships operating on the New Zealand coast (Fig.14). It is interesting to notice that this number has been fairly constant since the end of the second World War, but it is less than half the figure for the peak year, 1924.

On the other hand, the total shipping tonnage represented by this smaller number of vessels is slightly more than the total tonnage in 1924. The graph (Fig.14) shows that the increase in tonnage took place between 1945 and 1950. This can be explained by the fact that



M.V. Coronation (left) berthed at Auckland.

Built as a schooner in 1902, this vessel is now trading
to North Auckland.

On the right is the ferry to Waiheke Island.



M.V. Holmwood, here berthed at Lyttelton, is one of
the most modern vessels on the coast.

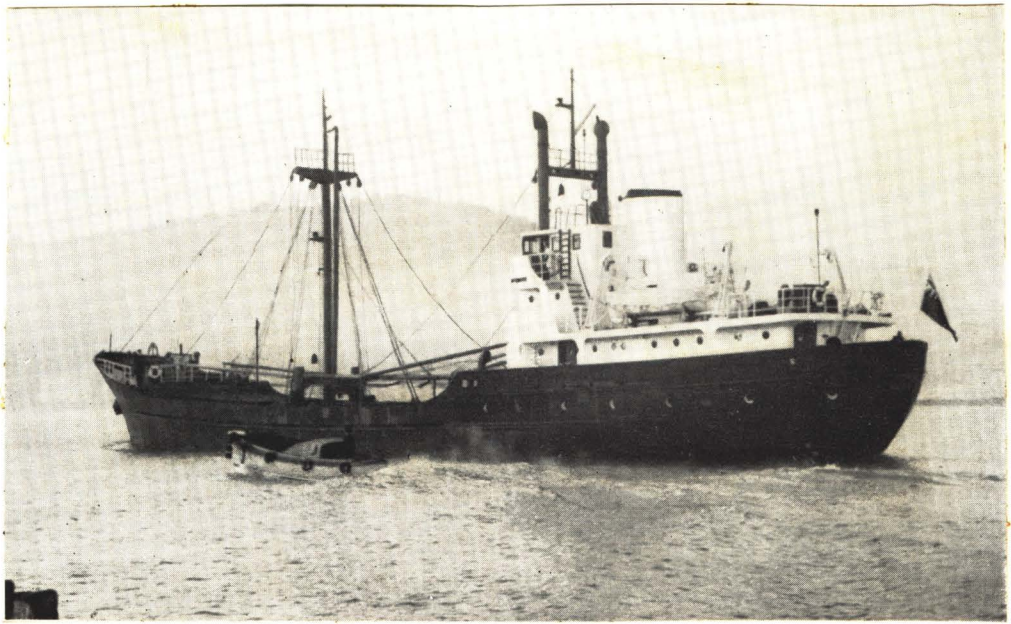
small vessels operating local services, particularly in the Auckland province, have slowly been taken out of commission. Since the War they have been replaced by larger vessels designed to operate in the inter-island trade.

Nevertheless, even in 1956, the majority of coastal vessels were of less than 200 net tons, and only sixteen exceeded 1,000 tons (Fig.15). This latter group represents more than half the total shipping tonnage, and so it is reasonable to assume that they carry the bulk of the cargo shipped on the coast. This assumption is given further weight if reference is made to Figure 34, for the vessels in this group are employed in the distribution of coal and petroleum products, and in the inter-island produce trade.

Trade Routes:

The investigation of shipping services revealed that each company has a well defined series of ports to which it trades. Furthermore, individual vessels within each company follow, month after month, almost unvaried trade routes.

It has thus been possible to represent this pattern of coastal trade in map form (Figs. 17 to 28). It will be seen that, Company A is chiefly concerned with east coast inter-island trade and experiences competition from companies B and E. Companies C and D specialize in the trade between ports of the North Island west coast and the South Island east coast, and share this trade with Company B. Company 1 trades from Auckland to the far north, while most other companies are occupied with special cargoes or with the large volume of business across Cook Strait.



M.V. Poranui is typical of the smaller coastal vessels.



Coastal vessels loading at Dunedin for Auckland.

The routes of only nineteen companies have been plotted. Those not represented are two companies trading chiefly between the Nelson Bays and Wellington, and some companies which trade chiefly between Auckland and the neighbouring islands.

Frequency of Service:

The construction of Figure 29 has presented something of a problem. Most of the information was derived from shipping companies' records of the movements of their ships during 1956, but a few companies were unable to grant access to such records. In order to make the coverage complete, the information obtained from the shipping companies was correlated with port records of arrivals and departures, and with advice on shipping movements published in local daily newspapers.

It was then found that if every shipping movement was plotted the map would become quite unintelligible. The pattern has therefore been simplified showing movements in one direction only. Coastal movements from south to north were chosen because vessels trading from the North Island to the South Island normally run directly to their most distant port of call. They then trade to various intermediate ports in both islands as they work their way north. While Figure 29 gives some idea of shipping activities on the New Zealand coast, it still fails, in many cases, to show the frequency of service from one part of the country to another. Further explanation is required.

The greatest volume of shipping appears to be between Auckland and Whangarei, but this represents frequent shipments of cement from Portland rather than general trade.

Cement shipments also account for the surprisingly frequent services from Golden Bay to North Island ports.

Services between Lyttelton and Wellington dominate the map and they are indeed important. It must be remembered, however, that more than half of these sailings are those of the inter-island passenger ferries which run a two-way nightly service on six nights of the week. Nevertheless, it is not generally realized that, in addition to carrying some 300,000 passengers and 25,000 passengers' vehicles each year, the ferries carry a considerable amount of general cargo (Figs. 42 and 36). As well as facilitating the regular delivery of surface mails, the ferries carry many perishable commodities. On 12th February 1959, for instance, the "Maori" loaded at Lyttelton 240 cases of peaches, plums and apricots, thirtyseven cases of frozen poultry, and ten trade vehicles.¹

On an average there are a further fourteen sailings each month between Lyttelton and Wellington, and four between Kaiapoi and Wellington. Some of the smaller vessels run a fairly regular weekly service.

Nelson is as well served as Lyttelton with sea services to Wellington. Two companies share a nightly two-way service on this route, and three other companies operate regular services from the Nelson area. The frequent sailings from Westland to Nelson are nearly all vessels carrying bulk coal cargoes (Fig. 35).

While they are not easily distinguished on the map, other inter-island services are important in the trade. An average of three sailings per week by the Picton to Wellington passenger ferry provides regular transport for mails and for new motor vehicles from Wellington.

¹ News item: Reported in the Christchurch "Star", 14.2.59.



T.E.V. Hinemoa, one of the ferries on the nightly
run between Wellington and Lyttelton.



M.V. Wairua, which is operated between Bluff and
Stewart Island by the Marine Department.

The Blenheim area is well served by a small vessel making two weekly trips between Wellington and the Wairau River.

The four companies trading from east coast South Island ports to the west coast of the North Island, average a total of ten round trips, a month. Not all ports on this route are served by each company, but competition is keen. Ships are small and services are frequent. One company, operating a single ship, runs a round trip between Timaru and Wanganui every ten days.

By contrast, services are much less frequent on the routes from the South Island to east coast North Island ports. Vessels are larger and fewer companies are competing. Of the four trips per month from the South Island to Auckland, only two originate at Bluff. One company's records of shipping movements show that the average time for the trip from Dunedin to Auckland is seven days, although the interval varies considerably. Most of the time is spent loading at intermediate South Island ports, the trip from Lyttelton taking less than three days.

The only other area of significant coastal activity is on the east coast of Auckland province. Here, in fact, are truly coastal services, almost as frequent as are the road and rail freight services in other parts of the country. In summer, Awanui may receive as many as four coastal visits, a week, while boats run twice weekly from Auckland to the Bay of Islands, Thames, Coromandel, Whitianga and to Tauranga. Further south, Kutarere, Hicks Bay, Tokomaru Bay and Tolaga Bay average four visits monthly from Auckland-based coasters.



The Port of Picton, Queen Charlotte Sound.



Scow berthed at Blenheim on the Opawa River.

An idea of the frequency of New Zealand coastal services is given by the fact that nearly 13,000 coastal movements were recorded during 1956. This is six times the number of overseas arrivals for the same year.

The seasonal regime for shipments of various commodities will be discussed in a later chapter, but in general there is very little seasonal variation in the intensity of coastal activity. November, February and March were the only months of 1956 in which more than 190,000 tons of cargo were carried. The first maximum is probably due to pre-Christmas business, while the approaching end of the financial year gives an impetus to business in February and March. Apart from January, when many business houses are closed, the only month in which cargoes fall below 170,000 tons is June. Very little agricultural produce is shipped during this month.

It has thus been shown that services across Cook Strait are remarkably regular and frequent, and indeed dominate the picture of coastal trade. Activity is only slightly less intense on the eastern and northern coasts of Auckland Province where other forms of transport are not well developed. The southern part of the South Island is not so well served, and some shippers claim they would ship more cargo if services were more regular and more direct. It seems doubtful if they could substantiate this contention with actual evidence of sufficient regular cargoes. It can be assumed that shipowners would at least give such services a trial if convinced that they were justified.

Problems:

"If you could fix weather, labour shortages, shed space, and ber harbours our worries would be eased considerably." This statement by the Manager of a coastal shipping company is a good summary of the main problems facing shipowners today, although there are others.

Wet weather is the most acute problem on the waterfront. Road and rail freights may be handled under cover, but sea cargoes must be loaded into ships' holds which are open to the weather. Occasionally coastal vessels are delayed for a week or more because of rain, and shorter delays are frequent. The only available statistics suggest that in 1956 at most ports weather delays accounted for between five and fifteen per cent of the cargo handling costs.¹ Although these figures take no account of time during which vessels in port did not employ labour, some interesting regional variations are to be noted. It is not surprising that Bluff and New Plymouth, both in areas with a high number of rain days, had the most expensive delays due to rain. Wellington, Dunedin and Westport were the only other major ports where weather expenses exceeded ten per cent of the total handling costs. It will be shown in a later chapter that this problem is not insurmountable.

Another difficulty faced by shipowners is the loss of use of shipping due to the annual survey of cargo vessels under the Shipping and Seamen Act of 1952 (Fig. 16). In other countries in the Commonwealth, surveys of cargo vessels are required every four years. With the object of alleviating this difficulty the New Zealand Shipowners' Federation has made representations to the Government over a period of eight years for a

¹ Waterfront Industry Commission Annual Report and Statement of Accounts for the year ended 31st March, 1957. pp. 40-41.

second dry dock at Auckland.

It is also contended that the Government allows insufficient depreciation allowances, free of taxation, for the replacement of tonnage. The United Kingdom Budget of 1957 has increased the tax-free allowance for depreciation to 40 per cent above that allowed in New Zealand.

A transport service cannot operate efficiently without the regular availability of cargoes. It has been shown that the overall amount of cargo offering is distributed fairly regularly throughout the year. From a more detailed point of view, an examination of the coastal imports and exports reveals that return cargoes are not readily available on some routes. (Figs. 9 and 10). Compared with the volume of imports, conspicuously little cargo is shipped from Raglan and New Plymouth. During the fruit season especially, there are also very light return cargoes carried from Wellington to Golden Bay and Tasman Bay ports.

Problems associated with berthing and cargo handling facilities have already been discussed, and those resulting from the employment of shore labour will be discussed under the next heading.

The conclusion is that problems directly associated with the coastal fleet are relatively few and that the greatest weakness in the system is their dependence on fine weather.

PART C: LABOUR.

To man the coastal vessels, maintain the ports and to handle the cargoes carried, a large labour force is required. In recent years very few of the problems confronting New Zealand's coastal trade have been directly associated with labour.

Usually there is no difficulty experienced in manning the coastal fleet. High wages can be earned and there are always plenty of young men eager to follow a seafaring career. During the last few years there has been a shortage of suitably qualified engineers. This shortage is partly due to the increased number of shore jobs which have become available with the opening of new factories in the country. In 1956 there were 1,771 men employed on coastal vessels.

There appears to be no shortage of labour for operating port facilities. Men who have retired from the sea often find suitable employment with harbour authorities, while the clerical work is as attractive to accountants as that of any other Local Body.

Waterwide workers are engaged for the handling of cargo on ships, on the wharves and in the transit sheds. They are employed by the hour and allocated by the port bureau to jobs where they are employed in gangs. These may consist of varying numbers of workers depending on the operation and the type of cargo to be handled. The workers are mainly members of the now separate port unions which are autonomous. The unions are under the over-riding control of the Waterfront Industry Commission appointed by the Governor-General, and of the Waterfront Industry Tribunal.

Apart from these, the Port Employers' Association represents the shipping companies and other employers of waterside labour at each port.

There is no shortage of men wishing to join the unions, but temporary labour shortages still occur. At 31st March, 1957, there were 6,275 registered waterside workers supplemented by a non-union casual labour force equivalent to 500 permanent men. Many of the latter were drawn from the crews of the ships themselves. During 1957, shortages exceeding 2,000 man-days occurred at Auckland, Wellington, Lyttelton, Dunedin, Timaru and Bluff. Coastal vessels are occasionally delayed at these ports. At Wanganui labour shortages caused considerable delays, while minor delays occurred at Onehunga, Tauranga and Napier.

As a general policy labour is allocated according to the time of arrival of the vessel in port, but priorities have been established for the Inter-Island Steamer Express and vessels carrying perishable cargoes. At a number of secondary ports there is also an arrangement whereby an overseas vessel utilizing all the labour is required to release sufficient men to work two gangs on a coastal vessel.

Prior to the 1951 Waterfront Strike, many restrictive practices had grown up in the industry. They included "spelling", extended "smoko", early leaving, unnecessary stops for wet and windy weather, restriction of sling loads, and the over-manning of certain coastal vessels. These features have now been largely eliminated and rates of work are still approximately twenty-five per cent better than prior to 1951.

The over-manning of coastal vessels has official status at some ports. At Castlecliff the minimum labour gang comprises sixteen men.

Small vessels cannot absorb this number, and avoid the port if possible. Situations such as this are, however, exceptional. In general the labour force serving coastal trade is adequate, well organized, and as efficient as the mechanical equipment allows.

CONCLUSIONS:

It has been shown in this chapter that coastal services are carried on by a large number of private companies, each operating a small number of vessels on fixed routes. Despite the limitations imposed by the river ports, they run frequent and fairly regular services up and down the coast as required, and particularly across Cook Strait. While cargo-handling facilities and labour supplies are considered adequate by port authorities, the fact remains that coastal vessels spend most of their time in port. (Fig. 16). Multiple handling and congestion in transit sheds, particularly at railway ports, add greatly to the time taken for goods to reach the consignee. It is concluded that, while there is no evidence of gross inefficiency in the coastal services, there is need for reorganisation in the methods of cargo handling if coastal shipping is to compete with other forms of transport. A later chapter will examine ways in which these methods might be improved.

CHAPTER III.COASTAL TRADE

No geographical study of a transport system would be complete without a consideration of the commodities carried, their areas of production and consumption, problems associated with their transportation, and the future prospects for trade in various goods. Indeed, it is this section of the thesis which is the major original contribution to the study of New Zealand coastal trade. Most of the information has been represented in the diagrams of Volume I, but it is considered that an explanation of the patterns of trade is necessary.

The products carried coastwise are many and varied. (Fig. 34). Flowcharts could not be drawn for every commodity, but those selected for detailed study constitute more than three-quarters of the total volume of coastal trade. They may be grouped into three categories on the basis of their patterns of distribution. There are those commodities which, because of their localised areas of production, originate from only two or three ports and are distributed to many ports throughout the country. Commodities whose distribution conforms to this pattern are coal, cement, petroleum products, sugar, frozen meat and lime. Motor vehicles, flour and other South Island primary produce fall into a separate category, for, although their patterns of distribution are fragmented, these commodities are shipped between only the North Island and the South Island. The remaining products are shipped to and from so many ports that it has not been possible to construct flowcharts of their distribution.

Of the latter group, a few have been selected for study because of their prominence in the coastal trade or because of their interest to the geographer. They are: fresh fruit, cheese, manures, iron and steel goods, alcoholic beverages, butter, other milk products, wool, timber and paper.

A. PRODUCTS FROM LOCALISED AREAS.

Coal:

It is not surprising that the cargo featuring most prominently in the coastal trade is bulky, comparatively low in value and not very perishable. (Fig. 34). Virtually all the coal carried on the New Zealand coast is shipped from Westport or Greymouth (Figs. 33 and 35). It is loaded in hopper waggons at the mines and transported by rail to the wharf. Here the hopper is lifted off the under frame on which it is mounted, and the coal is discharged directly into the ship's hold. There is a certain amount of bin storage at the mines and at the wharves, but railway waggons must also be used for storage. When, due to weather conditions, there does not appear to be any possibility of vessels entering the river ports, the coal supplies have to be diverted by rail to South Island destinations. This constitutes a problem to the mining industry at certain periods when other demands on railway rolling stock are heavy. Only very large scale port reconstruction would remove this problem.

The shipping service is maintained, as required, by two companies which operate about seven different vessels. The flowchart (Fig. 35) shows that Auckland and Wellington receive the bulk of the coal shipments. This is not surprising, for the gas works and railways are the chief customers for Westland's high grade coal.



Vessel discharging coal at Auckland.



Scoops such as this are used to unload the cargo.

The vessels in the background are lying idle in
Auckland Harbour as a result of the reduced imports of
wheat from Australia.

The other dominant flow patterns for coal are the result of regular consignments for the cement works at Portland and Tarakohe, while smaller quantities are landed at ports in the southern part of the North Island.

With the development of ports and railways, coal shipments increased rapidly from 1885, reaching a maximum in 1910.¹ The development of oil-burning ships and of hydro-electricity had halved the trade by 1922 (Fig. 8). With the opening of the Otira Tunnel through the Southern Alps between Westland and Canterbury, the railways took over the distribution of coal to nearly all South Island destinations. This, together with the increasing use of electricity and oil in industry, has caused a further decline of 47 per cent in the coal trade since 1922 (Fig. 33). The future prospects for the coal trade are obscure. As a fuel the market now appears to be stable. Coal may, however, have some future in the by-products field or in improved methods of gas production.

Cement:

Although cement ranks third in the list of commodities shipped coastwise, the total tonnage shipped is only a third of the tonnage of coal. (Fig. 34). The pattern of trade is a simple one, as only two cement companies ship their products (Fig. 37). One South Island company ships to Wellington, Wanganui and New Plymouth, but South Island consumers are supplied entirely by rail and road transport. The North Island works, situated at Portland, ships the bulk of its production to Auckland, and also serves by sea the east coast North Island centres which are difficult of access by road and rail.

¹ Records of Marine Department, Westport.



M.V. Sumatra discharging cement into hoppers
at Auckland.



Shingle scows unloading at Auckland.



M.V. Golden Bay loading bulk cement at Tarakohe.

The shipment of cement is more highly organised and regular service than that of coal. Both the companies have their own vessels. The Portland works own two vessels each with a capacity of 400 tons, but employs other ships in addition. All the vessels are "one day load" ships, so that generally there are two loading at the works one day, while another two are discharging at Auckland. On some days, however, there is only one shipment for Auckland because another ship is loading for outports such as Tauranga, Gisborne and Napier. Tauranga receives a full shipment once every three or four weeks, while a similar quantity is shipped to Gisborne every two or three weeks. Napier needs at least 500 tons weekly, which is carried by outside ships.

Associated with the Auckland cement imports is a shipping service which is unique in New Zealand. This is the long established trade in sand and shingle which is used with the cement in the manufacture of concrete. While not classified specifically in the statistics of the port of Auckland, imports of these two commodities are estimated to total approximately 60,000 tons per annum. Since the 1930's this service has been maintained by several shipping companies operating scows, fitted with diesel engines, but today the sand trade is largely in the hands of one company operating two motor vessels especially designed for the job.

The sand is procured from many beaches between Parengarenga Harbour and Auckland, while shingle is loaded at Whangaruru Harbour and in the Bay of Islands. The Auckland glass works uses a considerable quantity of special quality sand each year. This is shipped from Parengarenga Harbour. At Auckland the sand and shingle, and also the



Vessels at Portland loading cement for Auckland.

cement, are unloaded into separate hoppers from which lorries can be loaded.

Vessels engaged in the sand and shingle trade are greatly affected by weather conditions on the coast, as they are running into bar harbours and open roadsteads. The regularity of service also fluctuates considerably according to conditions in the building trade which are in turn a reflection of the state of the internal economy of the country. The cement trade is of course affected in the same way.

The problem of wet weather is even greater in the cement industry, for it not only affects outward loading of cement, but also the inward shipping of coal from the South Island. To overcome this problem in part, the company intends to purchase a bulk-loading ship (similar to an oil tanker) which can work in all weather. Silos and bagging plants are to be installed at Auckland, Napier, Tauranga and Gisborne. The ship will carry approximately 1,800 tons. Such a vessel has already been purchased by the cement company at Tarakohe. Six men now load in three hours what once took forty men three days. The ship can take away three full cargoes of bulk cement a week, making approximately two trips to Wellington for every one to either Wanganui or New Plymouth.

With Silos now erected at the ports of discharge, this vessel can be worked in wet weather. There are a few occasions when it is held up both outside and inside the port of Wanganui, due to the river bar, but other than this there are no obstacles to delay the loading or discharge of cement. The only other transport problem occurs when bad weather delays the usual weekly arrival of a shipment of 800 tons of slack coal from the west coast.

It is probable that in the near future there will be changes in the pattern of the coastal cement trade. As our population increases there is a steadily growing demand for the product, but with the establishment of works at Waitomo, Westport and in Southland, there is likely to be a zoning of the supply. This could result in a decrease in the amount shipped to the east coast North Island ports. However, there will always be a big demand in the south and west of the North Island, where the absence of coal and limestone makes the establishment of a cement works extremely unlikely. Bulk shipment is the quickest and cheapest method of transporting cement provided distances by sea are not very much greater than routes by land. It is therefore likely that the future will see an even greater volume of cement shipped from Portland to Auckland and from Tarakohe to Wellington.

Petroleum Products:

Although motor spirit and kerosene rank only fourth in the list of commodities shipped coastwise (Fig. 34), their importance in the coastal trade can be judged by the fact that at three ports, i.e. Timaru, Oamaru and Bluff, they are the largest coastal import (Fig. 31). At Whangarei, Gisborne, Nelson and Picton, they are the second coastal import, and they are also conspicuous in the import figures for Wanganui, New Plymouth and Napier (Fig. 30).

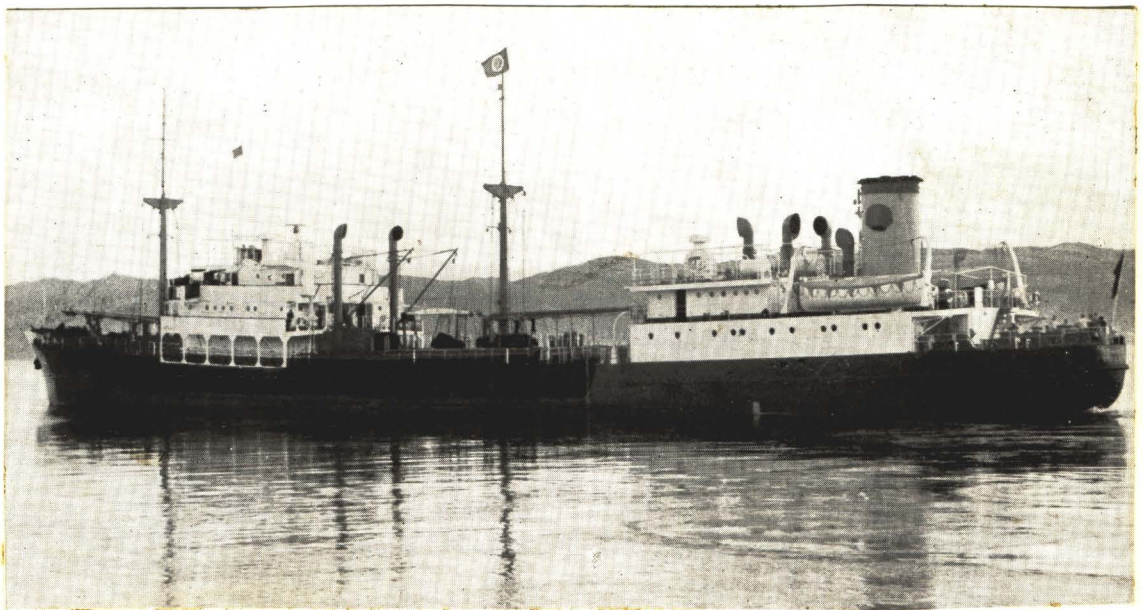
To appreciate the pattern of coastal trade in these commodities, (Fig. 38), it must first be understood that all the petroleum products used in this country are imported. More than a million tons annually are discharged into storage tanks at Auckland, Wellington, Lyttelton,

Dunedin, New Plymouth, Bluff, Napier, Whangarei, Nelson and Timaru. From the first three ports mentioned, products are transhipped to many ports (Fig. 38). In fact, of the total tonnage imported, one-tenth is transhipped. Thus petroleum products form the second coastal export of Auckland, Wellington and Lyttelton (Figs. 32 and 33).

Gisborne, Wanganui and Oamaru receive all their motor spirit coastally, because it is impossible for overseas tankers to berth at these ports, but all other major ports have their overseas shipments augmented by coaster. The need for this coastal supply arises firstly from the high costs involved in sending overseas tankers to ports around the coast. Furthermore, overseas shipments are by no means regular and the demand at the smaller centres is not sufficient to warrant large tank-storage capacities.

The coastal service is maintained by only one tanker. Designed especially for the coastwise transport of bulk and packed petroleum products, it can carry almost one million gallons at a time into all but a few of the New Zealand ports. It is owned by one oil company who also ship on behalf of one of their competitors. The vessel can load or discharge a full cargo in approximately sixteen hours from the time of tying up. Ports relying solely on coastal shipments receive regular visits from the tanker. Gisborne received ten shipments in 1956, Wanganui nine and Oamaru five. Bluff and Timaru were visited seven and five times respectively, but the other ports averaged only three visits each.

The extent and manner of the use of this vessel are thus largely dictated by the ruling overseas freight rates for second port



M.V. Tanea, coastal tanker for petroleum products.

discharges and by the attitude of the New Zealand Government in their recognition of increased coastwise costs in the price structure of petroleum products.

As far as expediency is concerned, but subject sometimes to weather and occasionally to berth availability, the coastal tanker leads rail by a long way. Most particularly is this true in the quantity of product which can be loaded, shipped and discharged into any port within, at least, three days or at the most, five. For instance, 1,000 tons could be loaded at Wellington and discharged at Gisborne within three days, whereas a similar quantity by rail would require 50 rail tank car trips. At the very best availability of cars of say three a day, this would take anything up to a month. The rail tank car cost from Wellington to Gisborne is £6-18-2 per ton. Actual expenses could not be disclosed by the Oil Company, but it is obvious that the cost of such a shipment by coastal tanker would not amount to anything like £7,000.

Thus, the coastal tankers makes for expediency, flexibility and economic cost in delivering petroleum products to the smaller ports of New Zealand. It is prevented from entering a few of the smaller ports because of their limitations of draught and wharves, but it is still an ideal method of transport.

The immediate future for the coastal trade in petroleum products appears to be fairly static. It is probable, however, that in years to come, more ports will be able to accommodate overseas tankers. If the demand for petroleum products at these places is large enough, then overseas tankers will pay them direct visits and the usefulness of the coastal tanker will be limited.

Furthermore, the cost of second, third, and fourth porting of overseas tankers might become such that it would be cheaper to do this, even with the delays of awaiting berths, than to operate a coastal tanker. This might come about through a fairly stable world-wide oil industry in which supplies equal demand, so that the overseas tanker service becomes absolutely regular and reliable. It is almost certain that Bluff will be supplied entirely by overseas tankers when its new port is completed, but apart from this example few changes in the trade pattern are to be expected for many years.

Sugar:

The most striking feature of the flowchart for sugar is the wide distribution of this commodity from the twin ports of origin, Auckland and Onehunga (Fig. 40). The supply of the product, and the demand for it, are fairly constant, so that it is a guaranteed cargo for many vessels. But the most significant fact about the sugar trade is the fact that it originates in the Auckland province, the area of greatest consumption for primary products from the South Island. Thus sugar is one of the major back-loaded cargoes for ships bringing products from the South. In fact, the flowchart for sugar (Fig. 40) is almost the reverse of the chart for South Island primary products (Fig. 41). It is, of course, a major commodity in the North Island trade, particularly that between Auckland and Wellington.

Although only one company is concerned with sugar refining in New Zealand, they own no vessels. Several shipping companies are consequently employed in the trade, but in general it is the large vessels

on the coast which carry sugar. The refining company claim that they ship their product to thirtytwo New Zealand ports, so it will be seen that figures for some of the smaller ports have not been made available for the flowchart (Fig. 40).

Each year approximately 100,000 tons of refined sugar are produced at the Auckland refinery. Of this approximately 55 per cent is shipped, 20 per cent is railed to North Island destinations, and 25 per cent is despatched by road. Most of that carried by road would no doubt be consumed within Auckland city itself, and, as half of the sugar shipped is discharged into North Island ports, it is obvious that ships are able to compete economically with the railways in the sugar trade to coastal centres at least. Shipping is favoured by the distributors because their product is relatively non-perishable. Wholesale agents in Southern centres, under special arrangement with the company, are able to carry reserve stocks for use in the event of shipping delays or stoppages. Thus there is no need to resort to expensive air freight.

The sugar trade will certainly increase steadily as New Zealand's population increases. Sugar is bulky, non-perishable, and is a clean commodity required in such constant amounts that it is a most suitable cargo for backloading in the vessels which carry produce from almost every port in New Zealand to Auckland and Onehunga. It is unlikely to be superseded as the chief coastal export of these two ports, (Fig. 32).

Meat:

In 1956, 7,000 tons of frozen meat were shipped coast-wise, but nearly all of this trade was between Picton and Wellington (Fig. 34). As overseas vessels do not usually visit Picton, produce from the local freezing works is shipped to Wellington for export. One shipping company operates a refrigerated vessel to accommodate this trade.

As well as the trade in frozen meat, tinned meat is exported from Auckland and Onehunga to South Island ports. The trade in tinned meat is, however, only a third of that for frozen meat (Fig. 34).

Lime:

More than seven thousand tons of burnt lime are shipped annually on the New Zealand coast, Motueka and Oamaru each exporting approximately half of the total (Fig. 33). Most of the lime is landed into Onehunga and Auckland where it is used in several industries. The remaining few hundred tons are landed at other North Island ports, chiefly Wellington.

Until recently, burnt lime was a very unpleasant cargo for waterside workers to handle, but conditions have been much improved by the use of multi-walled paper bags each holding seventy pounds of lime.

B. PRODUCTS WITH INTER-ISLAND DISTRIBUTION:

Motor Vehicles:

Motor vehicles feature conspicuously in the coastal trade because each vehicle occupies much shipping space and because thousands of vehicles accompany passengers between the North Island and the South Island each year. There is nevertheless an important trade in new vehicles (Fig. 34). Vehicles are assembled by two companies in Auckland, four companies in Wellington and two companies in Christchurch. The North Island companies ship a third of their production to the South Island, while those in the South Island ship two-thirds to the North.

The most conspicuous feature of the flowchart for the motor vehicles (Fig. 36) is the dominance of the trade between Wellington and Lyttelton. Nearly all the vehicles shipped on this route are carried by the nightly inter-island ferries which usually have ample deck space to accommodate them. Two other features of the pattern of distribution remain to be explained. Firstly, for a product manufactured in only three cities, the pattern of coastal distribution is surprisingly fragmented. Secondly, the number of vehicles landed at Nelson, Westport and Greymouth, seems, on the basis of population, to be high compared with the number landed at ports south of Lyttelton.

In most cases, vehicles are shipped from the port nearest the factory to the port nearest the agency, but deck cargo space cannot always be arranged when required. As a result vehicles for shipment are sometimes driven from Auckland as far south as Raglan, while Wellington vehicles may be driven up to Wanganui.

In Christchurch, as many as eighty vehicles may have to be stock-piled while awaiting shipment for Auckland. Sometimes vehicles for the South Island have to be shipped in coal vessels returning to Westport or Greymouth. From here, the cars are driven to agencies as far away as Invercargill. One major Southland distributor claims that, during 1957, only 14 per cent of his vehicles were landed at Bluff. It costs Southland distributors thousands of pounds a year to bring vehicles long distances overland to the province. Similarly, South Island vehicles for New Plymouth are normally driven up from Wellington during the weekends. The shipping difficulties are most acute during school holidays, when passengers' vehicles take all space on the inter-island ferries. No vehicles are flown across Cook Strait, but they are frequently railed to their destinations in both Islands.

The pattern of coastal trade in vehicles will shortly be changed by the introduction of a new vehicular ferry between Wellington and Picton. This vessel will be of the "drive-on" - "Drive-off" type, and will also be fitted with rails to accommodate up to twenty railway waggons. It is being built only after a long inquiry into the relative merits of sea and air transport. While regular transport for vehicles will be assured, it will not solve the problem faced by the Southland agencies. There is apparently a need for coastal vessels which have more space for deck cargoes.

Flour:

An interesting example of geographical inertia is to be found in the flour trade. From the 1860's and prior to the importation of

Australian wheat, Canterbury and Otago grew nearly all the grain for New Zealand requirements. It was therefore an economic proposition to establish flour mills in those two provinces and ship their products to the North Island consumers. Since the turn of the century, however, there has been a steady decline in wheat production. In 1927, the wheat crop occupied 261,000 acres; by 1952 the area was 90,000 acres, and by 1956 the area had fallen to 75,000 acres.² This decline was brought about by better returns from pasture seeds, mutton, and wool; by the impoverishment of soils, and by the risk of losses from hail, frost and insect pests. Thus, in 1956, in spite of increased yields per acre and the production of better grains for milling and baking purposes, New Zealand was producing only a third of the wheat for her flour, bran, pollard and seed requirements. The remainder (eight million bushels) was imported, almost entirely from Australia. Approximately half of this was landed into Auckland and Wellington, and the rest was discharged at Lyttelton, Timaru, Oamaru and Dunedin. Only occasionally is wheat shipped from the South Island to the North.

The pattern for coastal trade in flour, represented by Fig. 30, can therefore be explained not so much in terms of present day wheat production, but in terms of a situation which existed thirty years ago. This inter-island trade has been brought about by a situation where although two-thirds of New Zealand's flour is milled in the South Island, two-thirds of the total flour production is consumed in the North Island.

² F.R. Callaghan: "The Outlook for Wheat Growing", New Zealand Wheat Review, 1953, 1954, 1955, Christchurch, 1956, pp. 54-57.

There were, in 1958, twentyseven flour mills in the South Island and only eleven in the North Island.

But the high cost of inter-island freight is bringing about a further trend, despite the fact that the cost is met in part by the taxpayer under the subsidy arrangement. Within the last three years, five South Island flour mills have closed down. A new mill has opened at Mount Maunganui in the North Island, and an Oamaru firm has shifted to Christchurch prior to moving to Tauranga in 1959.

What then is the future of the flour trade? From the above facts a decline would seem to be imminent. The port of Oamaru alone expects to lose 6,000 tons of coastal trade as a result of the transfer of one mill. There are, however, other factors to be taken into consideration. There has been a recent substantial increase in the price paid to farmers for their wheat, and a new superior variety of wheat will be in full production by the 1959 season. The 1958-1959 season has been one of increased production, and already the number of ships regularly carrying wheat from Australia has been reduced from five to one. The success of the wheat crops is dependent on the weather, but it is quite possible that within two or three seasons New Zealand farmers will again be producing the bulk of the wheat required in this country.

Taking a long term view, reliance on overseas supplies from Australia and Canada is uncertain. Both are being rapidly industrialised and their populations are rapidly increasing. The time does not seem to be far distant when both may have their resources taxed fully to meet



New port at Mount Maunganui.



New flour mills on waterfront at Mount Maunganui.

their domestic requirements and have no supplies available to export. Should this situation eventuate, there is no doubt that the South Island east coast would remain the granary of New Zealand. The future of the coastal flour trade would thus seem to be assured, unless it gives way to a trade in bulk wheat which is more quickly handled at the ship's side.

Primary Produce:

The flow chart for primary produce (Fig. 41) was compiled from statistics for shipments of flour, potatoes, grain, cereal products, chaff, hay and straw. The grains are oats, barley and wheat, while bran, pollard and breakfast foods go under the heading of cereal products. These commodities together account for 6 per cent of the cargo carried on the New Zealand coast (Fig. 34).

As has already been explained, flour is not entirely a product of the South Island soils, but it has been included in the flowchart to help illustrate the dependence of the North Island on the South for its food supplies. Flour does, in fact, comprise half the total tonnage of primary produce shipped. Of the remainder, potatoes and grain each represent approximately one third, the other third being predominantly cereal products.

Two striking features of the trade are evident from the flow-chart. Firstly, it can be seen that Lyttelton and Timaru together are the ports of origin of more than four-fifths of the trade.

This is a reflection of the agricultural productivity of the Canterbury Plains, for the flour trade alone does not account for this localisation. The 1956 exports of potatoes, for example, were 13,000 tons from Lyttelton, 8,000 tons from Timaru, and 1,000 tons from Oamaru. The small exports from Dunedin and Bluff are almost entirely cereal products; no flour and virtually no potatoes are shipped.

Secondly, most of the primary produce is shipped to Auckland and Wellington, about equal quantities to each. The other main coastal ports of the North Island receive smaller quantities which appear to be approximately proportional to the population of their hinterlands.

At least seven shipping companies have a share in the trade, but one large company trading only on the east coast of both islands carries a quarter of the total. Competition is very keen and it is therefore surprising to find that a new shipping company was formed in April 1957, in order to take part in this trade. The shareholders include a grain merchant and a flour milling company of Timaru, and a Wellington motor company. They run a small boat on weekly trips between Timaru and Wellington in order to facilitate the delivery of their products.

The primary produce trade is distinctly seasonal, as virtually all the produce is shipped between the months of March and October inclusive. There is not an undue pressure placed on the shipping services, however, as this is the least busy period for the coastal trade as a whole. During the spring and summer months there is an increase in the amount of general cargo carried.

This is probably the result of the Christmas trade and the approaching end of the financial year.

From one year to the next there is also a considerable variation in the produce trade, reflecting the success of such crops as potatoes. For example, one company carried 29,000 tons of produce in 1956, and 40,000 tons in 1957. This increase was largely the result of increases of 6,000 tons of potatoes, and more than 1,000 tons each in oats and barley.

C. PRODUCTS WITH FRAGMENTED DISTRIBUTION PATTERNS.

Fresh Fruit:

While it has not been possible to construct a flowchart of the coastal movement of fresh fruit, one feature of the trade is obvious from a study of imports and exports (Figs. 30 and 33). Nearly two-thirds of the total tonnage is carried coastwise from Nelson, Mapua and Motueka to Wellington. In 1956 this amounted to approximately 28,000 tons, of which some 20,000 tons was transhipped into overseas vessels. Nearly half the coastal exports of Nelson and Motueka is fruit. During 1956 Nelson - Mapua exported 24,298 tons of fruit coastally and Motueka exported 12,152 tons. Together these tonnages accounted for more than three-quarters of the coastal fruit trade. Onehunga and Wanganui each received 3,000 tons of fruit from Tasman Bay ports, but only very small tonnages were sent to other centres.

Approximately 2,000 tons were transhipped in 1956 from overseas to coastal vessels. It is therefore concluded that of the 4,627 tons of fruit shipped coastwise from Wellington, at least 2,000 tons must have been produced in the North Island, and was probably early stone fruit from Hawkes Bay.

Other ports which both import and export small quantities of fresh fruit are Auckland, Tauranga, Gisborne, Picton, Lyttelton and Dunedin. In the main they are situated near fruit growing areas, but it is assumed that some of the exports from Lyttelton, Auckland and Dunedin are oranges and bananas transhipped from overseas vessels.

By adopting efficient methods of handling and ensuring speedy delivery, the coastal services are still able to compete favourably with air freight.

In the Nelson area, the boxed fruit is stacked on to wooden trays, or pallets, at the orchard, and taken by lorry to Nelson, Mapua or Motueka. Here fork-lift tractors unload the pallets either into cool stores, wharf sheds, or directly into the ships' slings as required. In this way the fruit is quickly loaded, and damage through excessive and rough handling is minimised.

Five coastal shipping companies take an active part in the fruit trade from the Nelson ports, and two of them share a nightly two-way freight service between Nelson and Wellington. At least two companies take one of their vessels off the Lyttelton to Wellington run in order to carry fruit during the height of the season.

Thus, by ensuring the quick and careful dispatch of this highly perishable and easily damaged commodity, the coastal shipping services are able to compete with air freight in the inter-island trade. Furthermore, shipping has the advantage of being able to land fruit for export directly into the wharf stores. It is possible to envisage an air service which could cope with the delivery of the Nelson fruit crop, but since the air freight service has been in operation there has been no diminution in the tonnages of fruit shipped from Tasman Bay ports.

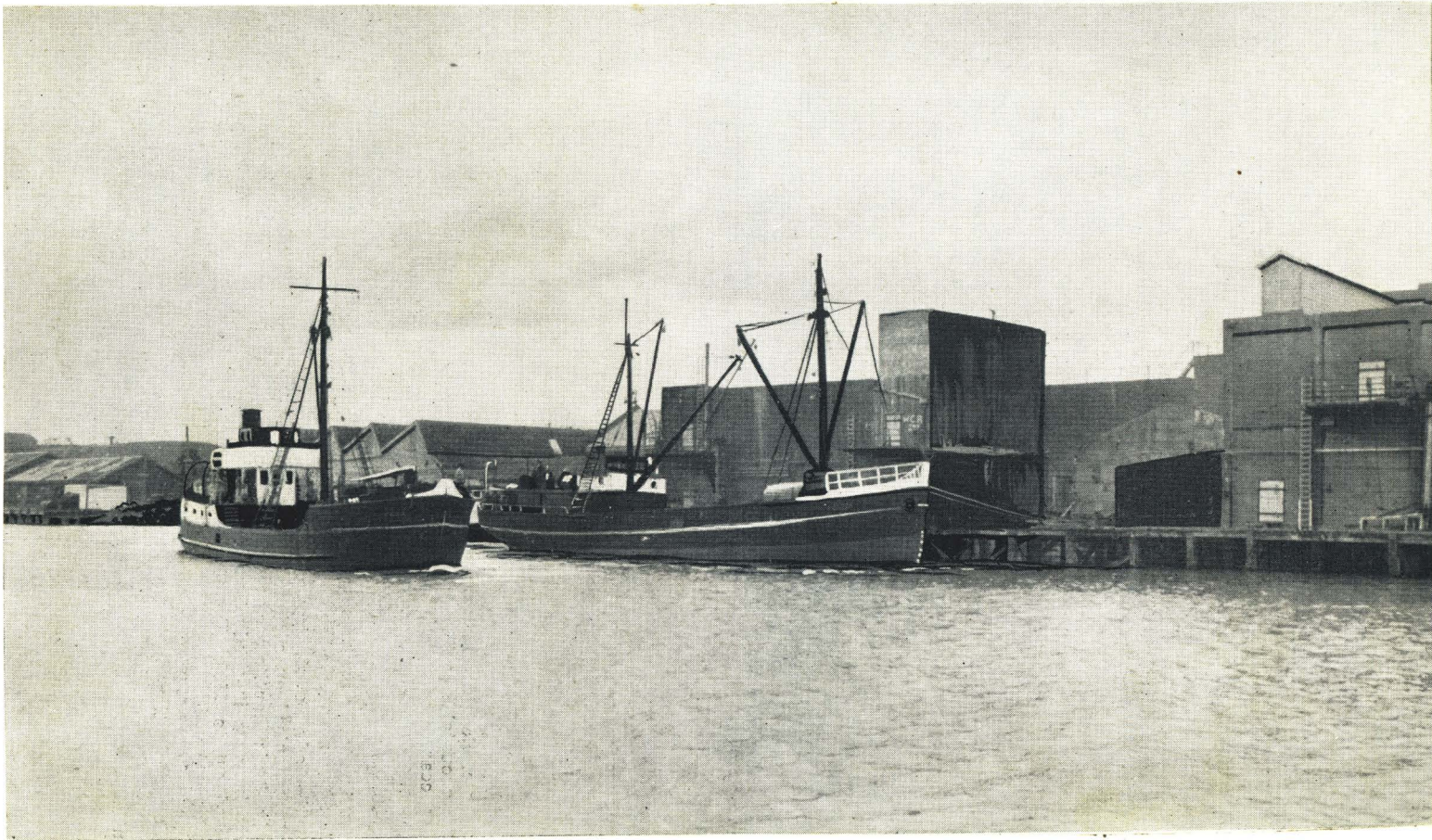
Cheese:

Of the 29,000 tons of cheese carried coastwise during 1956 (Fig. 34), 90 per cent was transhipped into overseas vessels. Consequently it is not surprising to find that Wellington imported 94 per cent, and Auckland 6 per cent of the cheese shipped coastally.

Auckland imports nearly all its cheese from Whakatane. From this port a regular service, maintained by small motor vessels, is able to compete with road and railway transport to Auckland. Wanganui and Picton export approximately 2,000 tons and 1,000 tons respectively each year to Wellington, but the chief cheese exporting port is Patea. In 1956 this small port exported 24,000 tons of cheese (Fig. 32). All of this was shipped to Wellington by a local producer-owned shipping company. During the year ended 31st March, 1957, their three small vessels made a total of 162 trips to Wellington.

The trade is somewhat seasonal, as is evidenced by the monthly export figures for Patea. Although the monthly exports from April to July were little more than 1,000 tons, during the spring and summer months there was a steady increase which reached a maximum of 3,500 tons in December. The seasonality of the trade is also reflected in the number of sailings per month. In June there were nine sailings, while in December there were twentyone.

The problems facing this shipping company are many. It is impossible for a regular service to be maintained, because Patea is a tidal river port with a bar at the entrance. Being exposed to the prevailing southerly and westerly weather conditions, the bar is frequently not negotiable. The service is also disrupted when labour shortages in Wellington occur, delaying the return voyage so that tides are missed. Another major problem is the lack of return cargoes from Wellington. On 124 occasions during 1956, vessels returned to Patea empty.



Coastal vessels at Patea wharves with cool stores in background.

This is due partly to the fact that timetables cannot be followed, and partly to the loss of Customs facilities at Patea in 1951. Consequently, road and rail services enjoy a competitive advantage, despite the fact that sea freights and wharfages are very much cheaper, especially for bulky cargo.

Until recently the freight on cheese shipped to Wellington was paid by the overseas shipping companies. With the discontinuance of this practice, and the larger number of overseas ships calling at New Plymouth, road and rail will now have a further advantage over sea transport from Patea. In 1957, the shipping company was forced to sell one of its vessels, and it is almost certain that the remaining vessels will be sold during 1959. It is therefore certain that New Zealand's coastal trade in cheese will decline almost to extinction within a few years.

Manures:

Manures rank with cheese in tonnage shipped on the New Zealand coast (Fig. 34), and, as with cheese, the trade originates almost solely from one port. In this case it is the port of Auckland that exports ninety-four per cent of the manures shipped coastally (Fig. 32). The only other significant coastal exports in this commodity come from chemical fertiliser works, shipping through the ports of Napier, Wellington, Lyttelton and Dunedin. It is nevertheless interesting that small tonnages of organic manure are shipped from Onehunga, Wanganui, Nelson and Bluff, as a by-product of the freezing works situated near these ports.

The predominance of Auckland in the coastal manure trade can best be explained in terms of the surface configuration of the Auckland province. While much of the fertiliser production is consumed in the inland areas of South Auckland, large quantities are required for the farming districts of North Auckland and the Bay of Plenty. These districts are all coastal lowlands which are well served by many ports (Fig. 3), and are comparatively difficult of access by road and rail. By contrast, the other fertiliser works in New Zealand serve large continuous areas of farming country, relatively well served by road and rail transport.

Most ports have some inward coastal trade in manures, but it is significant that, apart from North Auckland, the districts receiving the most shipments are Bay of Plenty, Wanganui and Nelson. Each of these coastal lowlands is supplied, through its ports, with more than 2,000 tons of manures annually.

Naturally, many shipping companies are involved in the manure trade, but one company dominates the North Auckland service. This organisation operates four vessels of less than 100 tons register. In summer they may average six sailings from Auckland a week, and in winter two sailings a week. This activity is an indication of the available trade in dairy produce rather than in manures, for the seasonal maximum for manure shipments is in the autumn. The vessels trade to five ports between Auckland and Houhora, but the bulk of the shipments go to Awanui. In 1956, 5,000 tons of manures were carried to this port.

The trade from Auckland was encouraged after the Second World War, when railway equipment was in short supply. The Government then introduced a subsidy on the sea freight of manure to some northern ports. There is still a need for this shipping service to coastal areas where land transport is difficult, but in general shipping would not seem to be the best method of transportation. The product must at some stage be widely distributed throughout each area, and this, in most cases, can be done more quickly when shipping is not involved.

Iron and Steel Goods:

Iron, steel and machinery together rank ninth in the list of coastal cargoes (Fig. 34). There is no definite pattern of movement in this trade, as most ports both import and export small tonnages of these commodities each year. Of the iron and steel shipped, nearly half has been transhipped from overseas vessels, so it is not surprising to find that all but a few hundred tons originates at the four main centres. The exports from Auckland and Wellington account for a very large percentage of the trade, with Wellington having a slight lead on Auckland.

In 1956, Tauranga headed the list of iron and steel imports, but this was a temporary trade in materials for the new port and paper industry. Lyttelton naturally imports a good deal of these materials from North Island centres, while the high import figures for Nelson are a reflection of its isolation from the South Island's railway system. The large iron and steel imports to Gisborne are also explained by the lack of any direct rail connection with Auckland.

The importance of these commodities in the picture of coastal trade lies not so much in the amount, as in the type of cargo shipped. Many of the consignments are in such large units that their transportation for any distance by road or rail would be extremely difficult. As for the large trade from the North Island to the South, it could not be adequately accommodated by the air services.

Wine, Spirits, Ale and Beer:

It is surprising to find that more than 23,000 tons of wines, spirits, ales and beer are shipped coastwise every year, for most of this trade is in beer. Beer is a commodity which greatly increases in bulk during processing. One would therefore expect to find it manufactured very close to the areas of consumption. The industry is indeed a ubiquitous one in New Zealand, but consumer preferences for different brands result in large quantities of beer being consigned from one end of the country to the other.

Auckland and Onehunga are the ports of origin of 84 per cent of the beer trade, while most of the remainder is shipped from Wellington to the South Island, and especially to Nelson and Picton. Smaller quantities are shipped to North Island ports from breweries at Lyttelton, Timaru and Dunedin. After Lyttelton, Nelson is the centre which imports the most beer. This is an indication of the convenience of regular sea services from Wellington and Onehunga. Gisborne imports a similar amount which is shipped from Auckland in the absence of a direct route by rail.

Napier, centred in New Zealand's chief grape growing district, exports quantities of wine which in 1956 amounted to 735 tons.

A small cider industry is associated with the apple crop of the Nelson district, and this port exports approximately 200 tons of the product each year.

Coastal trade in alcoholic beverages is likely to decline. Much of the trade is taken by the railways in both islands, and the transport of beer by road tankers is becoming increasingly popular. For instance, the Southland district is now served by tanker from Dunedin. Furthermore, as the cost of freight is borne directly by the consumer, some companies may establish new breweries in order to increase their sales. One Dunedin firm has already established a branch in Palmerston North. There is little likelihood, however, that air services will be able to compete with coastal shipping in the inter-island trade in this bulky cargo.

Butter:

In New Zealand, there is a tendency for cheese manufacturing to give way to butter production in areas of relatively sparse population, where the speedy delivery of milk to the factory is impossible. It therefore, is not surprising that the chief coastal exports of butter come from North Auckland, Bay of Plenty, Wanganui, and Golden Bay, Nelson. The dairy industry in each of these areas was established at a time when transport facilities were very poor, and area of supply to each factory was large. Butter factories still predominate.

Imports of 24,000 tons of butter in 1956 make this the third import of the port of Auckland (Fig. 30). In fact, Auckland takes 92 per cent of the trade in butter (Fig. 34).

Nearly all the ports of North Auckland, the Coromandel Peninsula and the Bay of Plenty contribute to the Auckland butter imports, but four-fifths of the total comes from Awanui, Whangarei and Whakatane. One company carries most of the North Auckland butter, giving an almost daily service during the Summer season of maximum production. Another company carries the bulk of the Coromandel production, while a third concern has a monopoly in the trade from Whakatane.

The only other ports importing butter are Wellington, Lyttelton and Dunedin. Wellington and Dunedin receive their small shipments from New Plymouth and Wanganui, but Lyttelton is given a special service by one small vessel trading from the Nelson area. The most obvious conclusion from these facts, is that butter is one of the few primary products in which Canterbury and Otago are not self sufficient. The imports to Auckland and Wellington, on the other hand, are not an indication of local consumption, as both ports export overseas many times the quantity of butter which they import coastally.

The only portion of the coastal butter trade which is likely to be eliminated in the near future, is that from North Auckland. It is almost certain that the butter production of this area will be exported from the new overseas port at Opuha when it is opened.

Other Milk Products:

This category includes condensed milk and milk powder (Fig.34). Together, they form a substantial volume of trade in which most ports have a share. At Bluff, condensed milk is the second coastal export, and regular consignments are shipped to nearly all major ports.

The milk powder industry is restricted to the North Island, and Auckland is the chief centre for the coastal despatch of this product. Whakatane and Opoṭiki also ship several hundred tons annually. The keeping quality of these products enables warehouses to build up reasonably large stocks, so that there is no need to resort to the more expensive air transport.

Wool:

Baled wool features conspicuously in the coastal trade, because it is the chief product of some of the more remote areas of the North Island east coast (Fig. 34). Many of these areas are not served by railway, and wool is such a bulky commodity that road transport is expensive. Sea transport is very suitable for this reason, and also because 60 per cent of the wool carried in this way is transhipped directly into overseas vessels. Most of these transhipments occur at Wellington.

The chief ports for the North Island wool-producing areas are Gisborne, Napier and Wanganui, and this fact is reflected in the 1956 figures for coastal exports. Wanganui, rarely visited by overseas vessels, exported coastally 8,648 tons (Fig. 32). At Gisborne, overseas vessels are loaded by lighter while moored in Poverty Bay, but much wool is still shipped coastally. Even at Napier, where overseas berthing facilities are excellent, wool is the chief coastal export (Fig. 32).

With improved roads in the East Cape district, road services are now running to Gisborne almost daily. Consequently wool is now the only coastal export from Tokomaru Bay and Tolaga Bay. Both ports receive approximately thirty visits a year from coastal vessels. The wool trade is, however, notably seasonal. For example, the export of 7,000 bales of wool from Tokomaru Bay takes place entirely in the period between October and February.

Timber:

In the coastal trade, the tonnage of timber compares with that of wool (fig. 34). Most of the trade is inter-island in character and 80 per cent of it is in soft woods. In 1956, Wellington imported nearly 70 per cent of the coastwise softwood cargoes, while other North Island ports imported smaller amounts. Greymouth, Motueka and Nelson each supplied approximately a third of the trade. During this same year, 10,000 tons of hardwoods, chiefly from Australia, were transhipped into coastal vessels. As much of this was despatched to minor ports and landing stages, it is impossible to trace, but 1,500 tons were landed at Greymouth where its chief use is in the coal mines.

Timber is a deadweight, non-perishable commodity which is suitable for shipment but most unsuitable for air freight. It is consequently assumed that as long as there is an inter-island trade, timber will be carried by sea. With the development of the new port at Mount Maunganui, it is probable that coastal exports from this area will increase.

Paper:

For many years there has been a considerable trade in paper products on the New Zealand coast. Most of this has come through Bluff from the factory at Mataura (Fig. 33), but Auckland, Onehunga, Wellington, Lyttelton and Dunedin export small amounts. A recent development in the trade is the coastal export from Tauranga of 10,000 tons of newsprint, most of which goes to Southern ports. It is probable that this export from the new paper works at Murapara will increase, as the product is not suitable for transport by air.



Coastal vessels loading newsprint at Tauranga.



M.V. Toa loading butter at Kutarere.

CONCLUSIONS:

The study of the coastwise movement of various commodities has clearly shown the pattern of coastal trade in New Zealand. Apart from shipments of coal from Westland to Nelson, and some trade in petroleum products from Lyttelton, there is no trade between South Island ports. In the North Island, there are coastal services to relatively isolated areas such as North Auckland and east Cape districts. In addition, there is a steady trade in cement, motor spirit, wool, sugar and butter within the North Island.

It is obvious, however, that by far the greatest volume of trade is between the two islands. The South Island exports mainly coal, motor vehicles, cement, flour, fruit, meat and other primary products to the North Island, and receives from the North Island motor vehicles, sugar and a wide range of manufactured articles. The possibility of the existence of well defined regions of coastal trade was investigated, but it was found that trade to and from each area was too varied to permit a logical subdivision.

In spite of the problems faced by shippers and shipowners, it would appear that for many years to come there will be little change in the total volume of coastal trade. No decrease is likely in shipments of petroleum products, primary produce, fruit, iron and steel goods, wool or meat. There may even be an increase in the coastal trade in motor vehicles, cement, sugar, paper and timber, but these could be offset by a decline in shipments of coal, flour, cheese, manures, alcoholic beverages and butter. There are also a large number of commodities, mostly light-weight manufactured goods, which are being lost to air, road and rail transport.

The volume of trade is thus not likely to greatly increase, but it is certain that, with changing areas of supply and demand, the future will see many changes in the pattern of New Zealand's coastal trade.

CHAPTER IV.

COMPETITION:

It has been shown that there are many suitable cargoes offering for coastal shipment, and that these are being transported as speedily as the present systems of cargo handling will allow. In this chapter it is proposed to examine the extent to which coastal shipping is able to compete with other forms of transport. To do this it is necessary to investigate any trends in the amount of freight carried by the coastal fleet as compared with the rail, road and air services. It is also vital to discover the reasons for these trends, and to find whether new techniques will be necessary or possible for coastal vessels to maintain their share of the trade.

Trends in Tonnages: While figures are not available for the total amount of freight moved annually in New Zealand, the following table gives some idea of the freight handled by the various transport services during the year 1956.¹

<u>TRANSPORT SERVICE:</u>	<u>TONS:</u>
Coastal shipping (inwards)	2,148,733
Railways	10,678,000
Road Services of Railways Department	217,193
Rail - Air Services	24,069
Scheduled Air Services - freight	8,372
mail	516
Non-scheduled Air Services	4,324

1 Abstracted from Report on the Shipping and Other Transport Statistics
of New Zealand for the Year 1956, Department of Statistics, Wellington,
1957.

Obviously there must be, in addition, a huge quantity of freight carried on the roads by private transport companies. The table is also inadequate in that it is impossible to compare shipping tons, usually based on forty cubic feet to the ton, and the systems of measurement employed by other services. It has been estimated, for example, that commercial air services carry the equivalent of 100,000 ship tons per annum.

Like that of the coastal fleet, most of the railways trade is in bulk or deadweight commodities. In fact, coal, manures, timber, agricultural lime and motor spirit make up 40 per cent of their total freight.

New Zealand's rapidly increasing population is reflected in the greater quantity of goods requiring transportation. It is apparent that the coastal services have not received a large share of this increase. From 1938 to 1956 coastal trade increased by only 0.6 per cent, while overseas trade increased by 71.5 per cent, and railway goods trade increased by 37 per cent. It is also obvious that, in spite of limiting legislation, the roads of New Zealand are carrying a far larger tonnage today than twenty years ago.

More recently, the commercial air services have taken much of the light easily handled cargo, their business having increased by 130 per cent from 1952 to 1956. During this five year period, sea and rail tonnages have remained almost static.

Reasons for Trends:

This lack of growth in coastal trade cannot be completely explained in terms of the self-sufficiency of areas throughout the country. The functions of the coastal fleet are being taken over in part by other

transport systems, particularly road and air. Several factors may decide a shipper to change to another method of transport. Chief among these are the rates charged, the convenience of dispatch, the speed of delivery, and the condition of goods on arrival.

(a) Rates: The freight rates charged by the various transport systems are rather difficult to compare because of the different systems used. The airways charge by the pound, or for bulky cargo by the "ton" which equals 120 cubic feet. The Railways Department charges by the ton weight or by the displacement ton, which in this case is forty cubic feet. The shipping companies also use ton weight or forty cubic feet, whichever is the greater, but do not include in their rates several extra charges that go to make up the total cost.

The accompanying tables have been compiled using rates supplied by the various services. The term Rail-Sea refers to cargo which is handled by the Railways Department and is shipped only between Lyttelton and Wellington. Rail-Air cargo is railed to Blenheim, flown to Paraparaumu, and then railed to its destination.

<u>HEAVY CARGO CHARGED ON WEIGHT.</u>				
<u>METHOD</u>	<u>CHRISTCHURCH TO AUCKLAND</u>		<u>CHRISTCHURCH TO WELLINGTON</u>	
	<u>Cost per Ton</u>	<u>Time Taken</u>	<u>Cost per Ton</u>	<u>Time Taken</u>
Express Air	£163. 0. 0	First Plane	£74.13. 4	First Plane
Freight Air	84. 0. 0	1-1½ days	37. 6. 8	1-1½ days
Air Cargo	63. 0. 0	3 days	28. 0. 0	3 days
Rail - Sea	5.18. 6	1 week plus	5.16. -	2 days plus
Rail - Air	12.16.10	1 week	12.16.10	1 day plus
Sea	5. 2. 0	1 - 2 weeks	4. 2. 1	2 days plus
	plus other costs	(72 hours sailing time)	plus costs	

LIGHT CARGO CHARGED ON DISPLACEMENT.

<u>METHOD:</u>	<u>CHRISTCHURCH TO AUCKLAND</u>	<u>CHRISTCHURCH TO WELLINGTON</u>
	<u>Cost per ton Time Taken</u>	<u>Cost per Ton Time Taken.</u>
Express Air	£168. 0. 0	£74.13. 4
Freight Air	84. 0. 0	37. 6. 8
Air Cargo	63. 0. 0	28. 0. 0
Rail-Sea	17.15. 6	17. 8. -
Rail-Air	6. 0. 0	6. 0. 0
Sea	15. 6. 0 plus other costs.	12. 6. 3 plus costs.

TYPICAL CHARGES MADE AT RAILWAY PORTS.INWARD:

Handling at ship's side	5/- per ton
Haulage to shed	5/6 per ton
Sorting at shed	7/- per ton
Harbour Board Wharfage	5/- per ton

£1/2/6

OUTWARD:

Handling at shed	5/- per ton
Haulage to ship's side	5/6 per ton
Handling at ship's side	5/- per ton
Harbour Board Wharfage	5/- per ton

£1/0/6

From the table for heavy cargo it will be seen that sea transport is slightly cheaper than the Rail-Sea service. If the handling, haulage and sorting costs are included, however, the reverse becomes the case. Very light bulky cargoes are much more expensive to send by rail or by sea, so that the Rail-Air service becomes the more economical method.

Thus shipping is tending to lose its main advantage, which is its low cost, compared with other methods of transport. Furthermore, shipowners have frequently complained publicly that the rail and air services are not sticking to their scheduled rates.

This would be difficult to prove, but it is known that certain practices favour air transport. Two examples are quoted by a Wellington Harbour Board representative. Tobacco, once transported by sea from Nelson to Napier, now goes at a special rate by Rail-Air classified as a "fresh vegetable". Recently the Railways Department sent forty trucks from Christchurch to Blenheim to await an air consignment of 600 refrigerators. These trucks were there for a week, but if a consignee holds a truck for more than twentyfour hours, he is charged demurrage.

Shipping is, however, still considerably cheaper than air transport. It is also cheaper than the railways for cargoes that can be bulk handled. The shipping of motor spirit has already been mentioned as evidence of this. Another example is the statement by the Wanganui Harbour Board that, by importing their coal directly, the Wanganui Gas Works saves at least £20,000 per annum.

The rates charged by the shipping companies are as high as they are because of wet weather delays, high labour cost, taxation, and the high cost of surveys and replacements.

The enormous cost to the shipping industry of wet weather has been mentioned previously, but it should be noted here that at Bluff the cost of weather delays has averaged about one shilling per ton of cargo handled. Labour shortages, shunting, and the handling of hatches and gear cause further unproductive time in ports, but these together do not usually equal the losses due to weather.

It is well known that waterside workers are among the highest paid labourers in the country. As overtime is normally worked (sometimes more than twenty hours a week), the cost of waterside labour to the shipping companies is very great. It has been estimated that in Australia at least sixty per cent of all coastal shipping costs come from stevedoring charges, while in the United States the figure may be over eighty per cent. There is every reason to suppose that the situation in New Zealand is very similar.

All shipowners claim that their business is affected by state-subsidised competition. Government expenditure attributable to Civil Aviation for the period 1946 to 1956 would be between £15 million and £20 million. Further developments costing £11 million are planned for the next few years. For this expenditure no income was received prior to 1955 and since this date the income from air services has not exceeded £200,000 per annum.

A further indirect form of subsidy is in the full refund of petrol tax which the air services receive. All commercial air lines in Australia, the United States and the United Kingdom are obliged to pay petrol tax. One Australian company with flying hours similar to those of the National Airways Corporation is paying £600,000 in petrol tax. By contrast, the shipping industry and those who use ships are required to pay in full for all the facilities provided by the Harbour Boards and the Marine Department.

(b) Speed and Convenience: Many shippers claim that it is not the cost of coastal shipping but its slowness, unpredictability, and inconvenience which are the deterrents.

The frequency of coastal services has been examined in detail and found to be generally adequate. Even delays of a day or two, however, can be most distressing to consignor and consignee alike, and these can easily happen if there is wet weather, a shortage of labour, a shortage of railway trucks or congestion in the sorting sheds. Some shippers are thus forced to use alternative methods of transport, as in the case of the Mataura Paper Mills which have railed goods as far as Picton for shipment to the North Island.

Much of the inconvenience and delay arises from the number of times the goods must be handled, particularly at Railway Ports. A typical sequence is as follows: Carrier from factory to goods shed; rail from shed to wharf; crane from wharf to ship's hold and out again at destination; rail from wharf to shed; and carrier to warehouse. The article may be handled ten times in transit! This compares most unfavourably with any other method of transport and adds much to the total cost of shipping.

(c) Condition of Goods on Arrival: Unfortunately the risk of damage and pillage is much greater with sea transport than with air, road or rail. This is partly the result of the large number of handlings and partly due to the deep stacking necessary in ships' holds. Better packaging and stronger containers are required for many classes of goods, and this entails extra expense for the shipper.

Present Developments:

While there appears to be no growth of coastal trade, there are many developments throughout the country which should improve the

coastal services. These include harbour development schemes, mechanical aids in cargo handling, and modern vessels.

At Bluff an ambitious scheme involves the building of an eightyfour acre island with facilities including two coastal berths. These berths will be served by both road and rail traffic, and will be equipped with transit sheds to enable inward cargo to be sorted and delivered at Bluff instead of first being hauled to Invercargill as at present. Covered conveyor equipment has been installed to permit the all-weather loading of frozen meat into overseas vessels. It is possible that this system may later be used for loading coastal vessels.

A new breakwater is to be built to the east of the present Lyttelton Harbour. This will protect some three thousand feet of new berthage with modern transit sheds, cranes, and facilities for road and rail access. Reclamation will make available fiftytwo acres of marshalling yards. Certainly more vitally necessary for the coastal trade is the proposed Lyttelton to Christchurch Road Tunnel with its assessed capacity of 2,000 vehicles per hour. When this is completed, the wharves will be modified for road transport and sheds will be provided to eliminate the present congestion at the Christchurch Railway Goods Sheds.

At Whangarei a new wharf under construction will berth two coastal vessels. New wharves are also under construction at Opua, (in the Bay of Islands,) and at Napier.

Modern cargo-handling equipment is being increasingly used at the larger ports. A notable improvement is the pallet system being operated at Nelson, while new facilities for the bulk handling of cement,



Bluff Harbour Development Scheme, November 1954.



Bluff Harbour Development Scheme, November 1958.

Berthage Basin ready for dredging.

oil and coal have greatly speeded the dispatch of these major cargoes.

Typical of the latest coastal vessels, the Holmglen has a cargo capacity of only 450 tons. It is thought by the owners that this will result in a quick turn-round and will be a partial answer to airways competition. To assist further, the ship is fitted with three sets of cargo gear which is more than usual for a vessel of this type. The holds are covered with patent sliding steel hatches.

A recent development on the waterfront is the move by some Unions to work, instead of three daily shifts, two longer ones. This has one very great advantage. During uncertain weather, hatches must be replaced at the end of each shift, an operation which may take an hour each day. The new system should greatly reduce this unproductive time.

Some Suggestions for the Future:

It is obvious that those concerned with coastal trade are conscious of the need for re-organisation in many branches of the industry. Much valuable work has indeed been done, but, if coastal shipping is to provide the most efficient service possible, then there is much which could be improved.

The replacement of the present fleet with small fast vessels should be carried out as quickly as possible. Loading will be carried out much more quickly if, like the Holmglen, these vessels have patent steel hatches and many sets of cargo-handling gear. A further development, already tried overseas, is the elimination of pillars in the holds, and a re-arrangement of ship's gear so that more deck cargo can be carried.

Better lit and more rectangular holds are also speeding up loading operations. One American company has introduced a revolutionary idea in the form of lifts in the holds. Vessels so equipped can handle general cargo at the rate of 450 tons per hour, about four times the average rate for New Zealand.

There is a basic need for reorganisation at the Railway Ports. It is regrettable that the users of these ports should pay such exorbitant rates just because their goods must be double handled. Freight could almost certainly be moved more quickly and more cheaply if, with the possible exception of Westport and Greymouth, the Harbour Boards took over the wharfinger work at these ports. Luckily, the Railways Department has no desire to continue this system, as its port activities have been operating at a loss. It will, however, take several years for negotiations and reconstruction work to be completed. In some countries coastal shipping companies operate their own pick up and delivery service at no extra cost to the shipper.

Already there has been an improvement in the packaging of cargo, but more could be done. Cargo can be handled much more quickly if it is packaged in large containers of regular size. This has reached its fullest development in America, where several companies use containers which are essentially truck bodies lifted from their chassis at the wharf.

Associated with this is a situation known in the industry as the "multiplicity of marks on standard lines". This means that identical articles in a consignment are marked for individual consignees. They have to be sorted and stacked in separate piles while awaiting delivery.

On one recent occasion there were 135 marks in one consignment of potatoes. This practice is quite unnecessary and contributes more than any other factor to shed congestion and consequent delays in delivery.

The very latest development in coastal trade has spread rapidly throughout the world, and one form of it is shortly to be seen in the Cook Strait vehicular ferry. It is generally known as the "Roll-on, Roll-off Trailership Service". Under this system ships are designed so that rail and road vehicles or trailers are rolled onto the ship on their own wheels. Secured firmly, they are shipped to their destination where they are run off, to be driven or hauled off to the consignee. Admittedly only about half the normal amount of cargo can be carried on a vessel by this method, but the tremendous savings in time, and in handling and sorting costs, make it an economic proposition. It is the best answer to air competition. In view of the time and money it would require to adapt New Zealand Ports and vessels to this system, it is suggested that a modification could be tried. Vehicles or, preferably, trailers could be hoisted onto the ship and lifted out at the other end.

Either of these two suggestions would eliminate the inconvenient and costly delays due to wet weather, but until they are operating in New Zealand some other method is required. It should be possible, for instance, to construct covered berths for coastal vessels. Such structures would be not unlike the large hangars which the Government are able to construct at Airports throughout the country.

In conclusion, it must be stressed that producers are not so much concerned at the cost of shipping, but at the uncertainty of the time of delivery. They will patronise other forms of transport in order to

be sure of the prompt and careful delivery of their products. While the shipowners are affected by the high cost of operating and replacing their vessels, they too are more concerned about expensive delays in port and the high cost of waterfront labour. The Harbour Boards and Railways Department would also be pleased to be rid of the responsibility of providing expensive sorting sheds and cargo-handling equipment. It is felt that all these interested parties would benefit if some of the above suggestions were put into practice. There is little doubt that the coastal fleet would then be able to provide the cheapest and perhaps the most convenient transport service in New Zealand. It is difficult to agree with Mr. Shand's statement that coastal shipping is driving itself out of business, but it has been shown that shipping is losing much general cargo to its competitors. It would appear that Mr. Shand is correct when he suggests that New Zealand's coastal shipping is among the least efficient in the world.

CHAPTER V.CONCLUSION:

It has been shown that New Zealand's coastal trade developed at a time when it was the only method of transport between many parts of the country. In spite of the decreasing number of ports, the trade increased steadily until 1928. Since this time, the volume of coastal trade has fluctuated because of the Depression, the Second World War, and waterfront strikes. For the past few years it has been fairly constant, but at a lower level than in 1928 due to the falling off of coal consumption and competition from other forms of transport.

Coastal shipping is a most suitable form of transport for New Zealand. The country is divided into three main islands, and is long and narrow, so that no part is far from the sea. Many inlets and bays make excellent sites for ports, but the rivers usually have off-shore bars which can cause delays to shipping.

The Ports are administered by various authorities and operated in various ways. Generally the facilities which they provide are adequate for the present system of cargo handling, but there appears to be a need for more sheds for the sorting and storing of cargo, and for road access to wharves served now by railway only.

The trade is carried on by a large number of shipping companies, each operating a small number of vessels on fixed routes. They operate services as frequently as is economically possible, but not as regularly as most shippers could wish. While the chief reason for this irregularity has been found to be the weather, other factors, such as congested sorting sheds, temporary shortages of rolling stock and of labour,

and unworkable river bars, contribute to the delays.

There is virtually no trade between ports in the South Island, but in the North Island shipping is able to compete with land transport to areas which are difficult of access. Coastal trade is, however, largely inter-island in character. The South Island exports are almost wholly in coal, motor vehicles, and agricultural produce, while manufactured goods form the bulk of the shipments from the North Island. The greater part of the coastal trade is in low value, non-perishable commodities which may be bulk handled. Coal, cement, motor spirit and manures are examples. Other commodities, such as motor vehicles and some iron and steel goods, are easily handled by ships but not by other transport systems.

The rates charged by the shipping companies should enable them to compete with other forms of transport, but it is obvious that road, rail and air services are capturing much of the general trade. The unpopularity of shipping arises from the long and uncertain time for goods to be delivered, the possibility of goods being damaged in transit, and the general inconvenience of shipping. It is felt that shipowners will continue to lose some business unless they follow the lead of shipping companies throughout the world and change their methods. Modern methods are designed to handle cargo quickly, carefully and without inconvenience to the consignor or the consignee. They include easily stowed vessels, large regular-sized containers, and services whereby cargo can be shipped while still loaded on road or rail vehicles.

It is apparent that many cargoes could not be transported from one island to the other by the present air services, and that coastal trade has enabled each island to specialize in products which the other requires. One has only to think of Westland's coal, Nelson's cement and fruit, Canterbury's agricultural produce, Wellington's motor industry, and Auckland's sugar refinery to see that coastal trade has contributed much to the distinctiveness of areas within New Zealand.

Perhaps New Zealand's coastal shipping is "about the most inefficient in the world" and, no doubt, it is losing trade to other transport systems, but it is still vital to our economy. While there is no reason to suppose that the present volume of coastal trade will decrease, it cannot be stressed too strongly that modern methods will need to be adopted if coastal shipping is to efficiently fulfil its role in New Zealand's transport systems.

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B I B L I O G R A P H Y

PUBLISHED BOOKS:

- ALLEN, Ruth: : The History of the Port of Nelson, Wellington, 1954
- CUMBERLAND, R.B. : The Geographer's Point of View, Auckland, 1950.
- EADDY, P. : Neath Swaying Spars, Auckland, 1939.
- Idem : Sails Beneath the Southern Cross, Wellington, 1954.
- FORD, P. and BOND, J.A. : Coastwise Shipping and the Small Ports,
London, 1951.
- HASSALL, C.E. : A Short History of the Port of Timaru, 1852-1955,
Timaru, 1955.
- McLINTOCK, A.H. : The Port of Otago, Wellington, 1951.
- : Port of Lyttelton, Lyttelton Harbour Board, Christchurch,
1958.
- : The Christchurch-Lyttelton Road Tunnel, The Tunnel
Committee, Christchurch, 1956.
- : The Port of Wellington, Wellington Harbour Board,
Wellington, 1956.

UNPUBLISHED UNIVERSITY OF NEW ZEALAND THESES:

- BARNES, V.M. : The Port of Lyttelton, 1956.
- GRACEY, L.M. : Export Hinterlands of the Ports of the North Island, 1951.
- NICHOLAS, M.O. : The Significance of Coastal Shipping in the Economic
Development of Northern New Zealand, 1953.
- TARPANT, A.E. : The Ports of Bluff and Otago, 1952.
- WARD, A.G. : The Seaports of the South Island, 1954.
- WHEELER, R.H. : The Port of Timaru, 1948.
- WRIGHT, R.A. : Tauranga and Whakatane : A contribution to the
Geography of New Zealand Ports, 1952.

BIBLIOGRAPHY (Cont'd.)

OFFICIAL AND SEMI-OFFICIAL PUBLICATIONS:

'Annual Report of the Marine Department, 1 April 1956 to 31 March 1957', Appendices to Journals, House of Representatives, (H.15), Wellington, 1957.

'Annual Report and Statement of Accounts', from all Harbour Boards, for year 1956.

'Report of Royal Commission of Inquiry into the Waterfront Industry', Appendices to Journals, House of Representatives, (H.50), Wellington, 1952.

Report on the Shipping and Other Transport Statistics of New Zealand, Wellington, 1922-1957.

New Zealand Gazette No.66, Wellington, 1868.

'Waterfront Industry Commission, Annual Report and Statement of Accounts for the year ended 31 March 1957', Appendices to Journals, House of Representatives, (H.45), Wellington, 1957.

PERIODICALS AND NEWSPAPERS:

CALLAGHAN, F.R. : 'The Outlook for Wheat Growing', New Zealand Wheat Review 1953-1955, 1956, pp.54-57.

'Coastal Shipowners Reply to Mr. Shand', The Press, Christchurch, 12 April, 1957.

'Mr. Shand Urges Cut in Coastal Shipping Costs', The Press, Christchurch, 13 April, 1957.

'Main Trunk Settlement', The Taranaki Daily News, New Plymouth, 4 Nov., 1958.

'New Zealand Coastal Shipping', The Press, Christchurch, 10 April, 1957.

'Reopening of Port of Kaiapoi', The Press, Christchurch, 15 November, 1958.

'Table of Flour Mills', The New Zealand Baker and Confectioner, August, 1953, p.2.

WALLACE, W. H. : 'Transport in New Zealand : A Review', New Zealand Geographer, April, 1954, pp.73-77.

'Wellington-Picton Car Ferry', The Press, Christchurch, 7 July, 1956.

REFERENCES FOR VOLUME I.

- Figures 1 and 2 : New Zealand Gazette No.66, Wellington, 1868.
- Figures 3 to 15 : Information supplied by Harbour Boards,
Report on the Shipping and other Transport Statistics
of New Zealand, Wellington, 1922-1957.
- Figure 16 : Log of vessel made available by Holm Shipping Company.
- Figures 17 to 28 : Information supplied by shipping companies.
- Figure 29 : Information supplied by shipping companies, and Harbour
Boards
Newspaper reports.
Ships' Manifests.
- Figures 30 to 41 : Report on the Shipping and other Transport Statistics
of New Zealand, Wellington, 1956.
Ships' Manifests.
Information from shipping companies
Additional information as follows:
- Figure 35 : Records of Marine Department, Westport.
- Figure 36 : Information from six motor assembly firms
- Figure 37 : Information from two cement firms.
- Figure 38 : Information from oil company.
- Figure 39 : Information from Wheat Research Institute.
- Figure 40 : Information from sugar refining company.
- Figure 42 : Information from Customs Department.

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